Final Report:

Shasta CRMP Coordinator
Calendar Year 1999

Submitted by:
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Cooperative Agreement # 14-48-11333-99-J041
Project Number 99-PC-02
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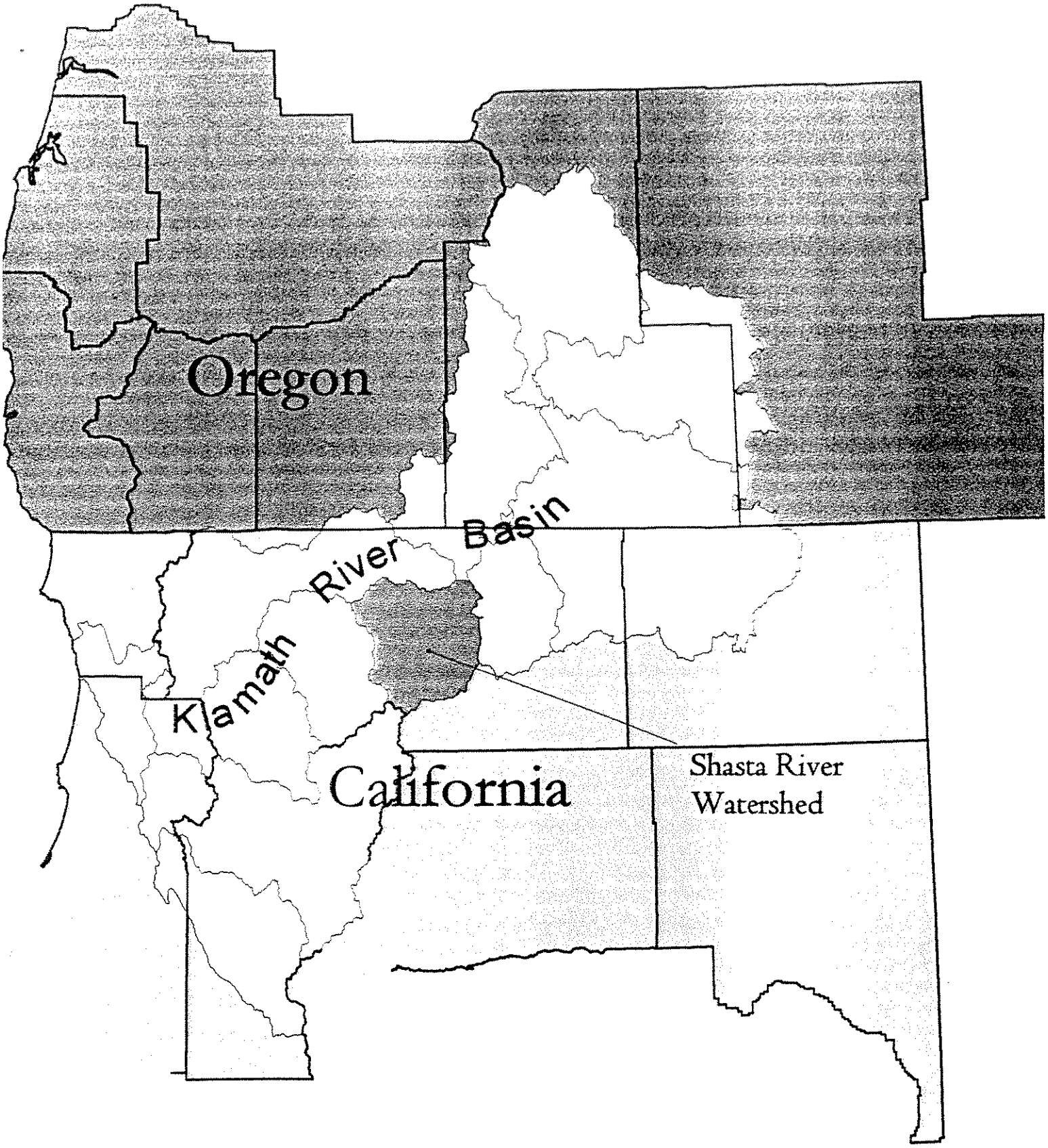
Oregon
Klamath River Basin
California
Shasta River Watershed

Final report: Shasta River CRMP Coordinator, FY 1999

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Abstract:

The Shasta CRMP has been engaged in fisheries habitat restoration work since 1991. 1999 included community outreach, ongoing meetings with landowners, agencies and political figures, work with developers of the Klamath Resource Information System (KRIS) program, pulsed flow preparation, fish screen investigations, Internet access to real time flow data, and the preparation and oversight of restoration projects. An array of other tasks were done as need and opportunity allowed.

Introduction

The Shasta River Coordinated Resources Management and Planning group (CRMP) was started in mid-1991, through the combined efforts of several members of the ranching community, the Siskiyou RCD, and the Natural Resources Conservation Service (then Soil Conservation Service). At that time there was no similar organization in Siskiyou County, and the prospect of developing a good working relationship amongst the various landowners and agencies seemed unlikely.

Given the magnitude of the task undertaken—to restore the productivity of the Shasta, while maintaining a healthy local agricultural economy—it was clear that efforts beyond what a volunteer group was capable of were required. Recognizing this, the Klamath River Basin Fisheries Task Force provided funding in FY 1992 for a part time Projects Coordinator to assist the CRMP in progressing from discussion, self-education and planning to project implementation, grant funding and community outreach.

That funding has been renewed at varying levels in FY 1993, 1995, 1996, 1997, 1998, 1999 and 2000.

Description of Study Area

The Shasta River and its major tributaries are part of the Klamath Basin, and total hundreds of miles in length, draining an area of approximately 800 square miles (see maps). They flow almost entirely through relatively small parcels of private ranch land. To be effective, any activity aimed at improving water quality for fish or human needs must be done with the active help and participation of a large number of individual owners whose needs, desires and financial conditions vary greatly.

Each of these ranchers has long-standing cultural practices, many of which depend on the river, including irrigation of pasture and hay fields, grazing of riparian areas, and watering of livestock. All of these activities can have a substantial impact on water quantity and quality.

Historically the Shasta River was an important spawning and rearing area for Chinook and Coho Salmon, and Steelhead. Records of Fall Chinook spawners kept since the 1930's show a long decline, from over 80,000 in 1931 to as few as 530 in 1992. Since 1992, numbers have climbed to as high as 13,000. Steelhead and Coho are likewise no longer present in significant numbers, although actual counts are not available.

Over the last ten years there has been an extensive program of water testing in the Shasta. Results indicate significant problems for cold water fish resulting from high water temperatures and low levels of dissolved oxygen. Additional fieldwork indicates severe problems of fine sedimentation. Other observed but less well documented problems include: blockage of coarse sediment by dams, groundwater withdrawals capable of affecting surface flows, high nutrient levels and consequent turbidity caused by free-floating algae.

The Shasta CRMP has developed a variety of responses to these problems.

Methods and Materials:

The Shasta CRMP serves generally as a broad oversight body, with the details of implementation of its goals left to the project coordinator. The coordinator works with individual CRMP members, agencies, and other groups and individuals to develop and implement specific actions that will further the CRMP's goals. In addition, the CRMP Coordinator must be available to respond to requests for assistance from the USFWS, TWG and Task Force, along with state agencies (including DFG and DWR), schools, and other restoration workers.

Information transfer and reporting is frequently accomplished verbally at CRMP meetings or to individuals, in written form in newsletters and agendas, electronically via email, and photographically. Most residents of the Shasta Valley do not make routine use of computers, so mailings and verbal reporting is the most effective way to communicate with them. Agencies and persons engaged in restoration planning generally all have ready access to computers and the Internet, making electronic data and document transfer their preferred method.

Project documentation has been done using photographs and slides, some of which have also been scanned for use electronically on the Internet or in the KRIS.

Post project monitoring and documentation, and responding to needs and opportunities as they arise can require almost anything by way of methods and materials. An engineering autolevel, steel T posts, hacksaw and post driver are used in setting up stream cross section profile locations; Hammer, nails, boards, shovels and tarps were used in sealing off an abandoned ditch; Arcview software, plotter and laptop computer were needed to prepare the presentation for Congressman Herger, etc.

Results and discussion of accomplishments:

Successfully meeting the overarching goal of this grant--assisting the Shasta CRMP to continue to make substantial steps towards restoring the Shasta River for salmonids--required a variety of approaches. General activities included

Coordination of fieldwork, both paid and volunteer
Meeting with interested parties, both individually and in groups,
Assisting with planning both within the Shasta Watershed and elsewhere in the Klamath Basin,
Meeting with Task Force and its technical work group,
Responding to problems and opportunities as they arose

This grant included a number of defined tasks to be completed, each of which will be described separately below:

Task 1—continue landowner contacts:

Throughout the 1999, contacts with landowners were maintained in a variety of ways, including newsletters and meeting agendas, which were mailed to all landowners bordering the Shasta or its tributaries, along with other interested parties, providing basic information on meetings, topics under discussion, and projects worked on. Mailings were sent to over 400 people, most of whom were farmers or ranchers in the Shasta Valley.

We maintained operation of Shasta telephone accessible river monitoring station (530-459-0416) for use by landowners in Shasta Valley and other interested parties. That station provides both verbal and electronic reporting of air and water temperatures, and river stage height. It also records conductivity and solar intensity.

Direct contact was concentrated on those individuals most interested in developing actual projects aimed at river improvements.

Additional contacts with other landowners were made via telephone, individual letters and direct contact.

Task 2: Schedule and arrange at least two Public Meetings:

We substantially exceeded goals in this category. Among the public meetings held were 4 CRMP meetings, two public informational meetings where the DFG explained the workings of the new 1603 stream alteration permit process as it related to irrigation dams and diversions, and two public meetings/workshops for ranchers wanting to prepare Rangeland and Water Quality Management Plans for their ranches.

Task 3--Prepare a minimum of 6 project proposals for restoration activities:

We substantially exceeded goals in this category also. Grants prepared included:

Klamath River Task Force:

- CRMP Coordinator
- Flow/temperature Model for Shasta River
- Irrigation Efficiency Improvements Through Soil Moisture Monitoring
- Cardoza Fish Screen
- Kuck Bioengineered Bank Protection
- Preliminary Engineering Study for Efficiency Measures to Reduce Water Usage by Shasta Water Assoc.
- Preliminary Engineering Study to Examine Options and Costs for Flashboard Dam Removal in Shasta
- Cost Share for USGS Shasta River Gauge
- Fiock Bioengineered Bank Protection

Cal DFG

- CRMP Coordinator
- Willow Matting Bank Stabilization on Kuck Property.
- Preliminary Engineering Study for Efficiency Measures to Reduce Water Usage by Shasta Water Assoc.
- Preliminary Engineering Study to Examine Options and Costs for Flashboard Dam Removal in Shasta
- Cost Share for USGS Shasta River Gauge
- Flow/temperature Model for Shasta River
- Irrigation Efficiency Improvements Through Soil Moisture Monitoring
- Cardoza Fish Screen
- Parks Creek Fine Sediment Sources Assessment
- Shasta River Coarse Sediment Assessment
- Fiock Bioengineered Bank Protection

USFWS Ecosystem Restoration Office

- Water Quality Monitoring
- Generic Livestock Exclusion Fencing

Cantara Trust

- Dissolved Oxygen Monitoring in Shasta
- Temperature Monitoring in Shasta

Presidents Salmon Initiative/5 Counties Planning Group

- Shasta Flow Temperature Model
- Emergency Response Planning for Droughts
- Outmigrant counting
- Preliminary Engineering Study for Efficiency Measures to Reduce Water Usage by Shasta Water Assoc.

Partners In wildlife

- Meamber Wetlands Protection Fencing

Of these, funding was secured for CRMP Coordinator, Cardoza Fish Screen, Kuck Bank Protection, Fiock Bank Protection, Flashboard Dam Removal Study, USGS Gauge, Parks Creek Fine Sed., Dissolved Oxygen Monitoring, Temp. Monitoring and Meamber Wetlands. Total funds secured: $265,800

In addition, the Shasta CRMP was instrumental in securing a $50,000 grant from DWR to DFG for equipment to use in monitoring salmonid outmigrants from the Shasta.

Task 4--Prepare digital map of riparian landowners along the Shasta River

Again, we exceeded goals on this task. As part of our ongoing GIS/mapping, we completed this task as specified, and further work was then begun on more extensive parcel mapping of the entire Shasta Watershed to facilitate future full watershed restoration planning. The Shasta CRMP Coordinator participated in the planning of Siskiyou County's implementation of conversion to Arcview/Arcinfo as part of this process. By the end of the first quarter of calendar year 2000 we had completed an Arcview coverage with parcel numbers, owners names and addresses for all 13,000 parcels in the entire watershed. See attached map.

Task 5--Inventory sites where Aquatic Invertebrates have been sampled by state and federal agencies in the past.

This task was completed. See attached list and map.

Task 6. Produce at least 8 newsletters.

This target was not fully met. Only 6 newsletters were produced.

While the Coordinator Grant included the above defined deliverables, it also included sufficient funding to allow pursuing needs and opportunities as they arose. This flexibility allowed the Shasta CRMP Coordinator to initiate a variety of actions to address opportunities that could not have been predicted in advance. Additional tasks identified and addressed in the course of the year included:

1. Meeting with and assisting the Yreka High School to transition management of its native Plant nursery to new staff
2. Providing all support to county wide effort to develop a Conservation Reserve Enhancement Program (CREP) focused on riparian protection.
3. Attending 3 TWG meetings.
4. Participate in BOR led Flow Study meetings
5. Meet with fish screen fabricators in Red Bluff, Orland, and Medford to evaluate alternative fish screen designs

6. Provide Shasta Watershed Orthophoto Quads to Yreka High School, help with their integration into existing High School programs.
7. Close off the abandoned Oregon and California Power-plant Canal.
8. Prepare for Pulsed Flows for 1999
9. Work closely with newly-hired Natural Resources Planner for Siskiyou county to introduce him to the complexities of fishery restoration in Siskiyou County.
10. Initiate meetings with key private landowners, timber companies, and supervisors to initiate plans to begin addressing TMDLs for the Shasta.
11. Provide extensive comments to Kier and Assoc. re: 10 year Review.
12. Prepare request to Calif. Fish and Game Commission to investigate adequacy of existing fishing closure at mouth of Shasta based on newly available habitat typing data from USFWS. See attached report.
13. Begin investigation of fish screen materials with anti-fouling properties for Meamber Screen.
14. Ram-rod agreement between BOR and DWR to allow DWR to use BOR GOES Satellite access license for flow gauging in Shasta River. Flows and temperatures watermaster's weir now on internet in near real time. See attached printout.
15. Meet several times with NMFS engineer to field test tube screen baffle designs.
16. Tour Shasta Restoration projects with new reporter for Siskiyou Daily News.
17. Assist with further development of KRIS.
18. Work with DFG Biologist to design and build 3 fish screens (work completed in 2000).
19. Revive DWR offer of cash assistance for Shasta River. Eventually secure $50,000 for outmigrant counting, along with commitment of future help.
20. Participate in RWQCB tour of Shasta Valley. Make presentation to RWQ Board.
21. Initiate sub-committee process to list and prioritize all known limiting factors for salmonids in Shasta watershed. Sub-committee made up of 4 DFG Biologists, Sisk. Co. Nat Res. Planner, USFWS Biologist, Consulting Hydrologist, plus Shasta CRMP Coordinator and HSU masters student. Draft matrix attached.
22. Provide slide presentation to Klamath Compact Commission on Shasta River.
23. Meet with Congressman Herger amd his staff to discuss restoration and secure his support for presidents Salmon Initiative funding.
24. Work with Yreka High School and Discovery High School to record stream cross section profiles at Meamber and Fiock Ranches.
25. Maintain DWR satellite up-link though winter to provide year-around reporting of flows.
26. Make preliminary measurements of electrical field generated by DFG counting weir in Shasta River.
27. Arrange for donation of lab space and transfer of equipment from College of the Siskiyou's for water quality work.
28 Do all preliminary and oversight work required for three livestock exclusion projects, one tailwater capture and reuse project, and one off-stream stockwater project.

Summary and Conclusions:

Prior to 1987, little salmonid restoration work had been done in the Shasta Watershed other than the construction and maintenance of approximately 10 fish screens, 4 fish ladders and the creation of 4 enhanced spawning sites. With the creation of the Shasta CRMP by landowners in the Shasta Valley in 1991, and the availability of funding for a part-time CRMP Coordinator who could develop restoration project ideas and secure funding for their implementation, things began to happen.

Task Force funding has been requested and received in 1992, 93, 95, 96, 97, 98, 99 and 00. In most years, $25,000 was all that could be allocated to the Shasta River, and the pace of work was adjusted to live within this budget. Because of delays in the congressional allocation process, in contract writing, and lead time on reimbursements, we have gone into each year with a substantial carry-over of funds from the previous years grant, there-by allowing work to proceed without interruption. In 1998, the funding level was increased to $33,000, leaving a larger carry-over than usual.

In 1999, we decided to use the additional carryover money plus the majority of the grant received for 1999 to add staff and increase the efforts expended.

The total spent on project coordination in 1999 was $38,950, and the results achieved were clearly indicative of what could be done on a regular basis with additional funding in the Shasta Valley:

* Nearly $266,000 in grant funds were secured.
* Most deliverables were substantially exceeded.
* Ground work was laid for future work in the form of support for additional funding from our Congressman
* Expanded outreach to Shasta Valley landowners resulted in a substantial number of restoration projects proposed in both 1999 and 2000, most notably in the Little Shasta and Parks Creek, areas largely unserved prior to 1999.
* A formal Limiting Factor prioritization process was substantially completed to guide future work, assist in securing outside funding, and supplement the *Shasta Watershed Restoration Plan*.
* Funding was secured to allow the DFG to begin systematically counting outmigrants from the Shasta, a critical step in developing an outmigrant index to show population trends.

On the other hand, even with this level of funding, some work had to be set aside. The greatest disappointment was the inability of the CRMP Coordinator to carry the workload associated with developing a Conservation Reserve Enhancement Program for Siskiyou County. The members of the committee working on it wished to continue with its development, in the belief that it would be the cornerstone of future Farm Bill funding for restoration work throughout Siskiyou county, and possibly much of the rest of the state. Despite the great potential it held, it ultimately was abandoned.

Monitoring of water quality using aquatic invertebrates was largely also left un-done, continuing the high level of uncertainty of the overall health of the aquatic environment.

While preliminary meetings were held on TMDL issues, inadequate progress was made, again for lack of staff time, despite the desire of landowners involved in the preliminary meetings to participate.

Lack of local support, resulting primarily from lack of CRMP staff to do necessary outreach, led to the collapse of efforts by Dr. Hardy to collect Shasta Valley data related to the flow study he was working on elsewhere in the Klamath Basin.

SHASTA RIVER NEAR MONTAGUE *(SRM)*

Elevation: 2426' · SHASTA R basin · Operator: CA Dept of Water Resources

Query executed Monday at 11:18:14

Select data type to plot recent data.

Date Time (PDT)	RIV STG *FEET*	FLOW *CFS*	TEMP W *DEG F*	BAT VOL *VOLTS*
Earlier				
2000 06/04 00:00	1.97	94	70.2	12.8
2000 06/04 01:00	1.97	94	69.4	12.8
2000 06/04 02:00	1.97	94	68.6	12.8
2000 06/04 03:00	1.97	94	67.7	12.8
2000 06/04 04:00	1.97	94	66.8	12.8
2000 06/04 05:00	1.96	91	65.8	12.8
2000 06/04 06:00	1.96	91	64.8	12.7
2000 06/04 07:00	1.96	91	63.7	12.7
2000 06/04 08:00	1.96	91	62.8	12.8
2000 06/04 09:00	1.96	91	62.3	12.9
2000 06/04 10:00	1.96	91	62.3	13.4
2000 06/04 11:00	1.96	91	62.9	13.3
2000 06/04 12:00	1.96	91	63.9	13.0
2000 06/04 13:00	1.96	91	65.3	13.1
2000 06/04 14:00	1.96	91	66.8	13.6
2000 06/04 15:00	1.96	91	68.2	13.1
2000 06/04 16:00	1.96	91	69.5	13.0
2000 06/04 17:00	1.96	91	70.3	13.2
2000 06/04 18:00	1.96	91	70.8	13.0
2000 06/04 19:00	1.96	91	70.7	13.4
2000 06/04 20:00	1.96	91	70.5	13.3
2000 06/04 21:00	1.96	91	70.2	13.1
2000 06/04 22:00	1.96	91	69.8	13.0
2000 06/04 23:00	1.96	91	69.3	12.9
Later				
Latest				

Warning! This data is preliminary and subject to revision.

Show SRM Map | 24 Hours SRM Data | Plot all SRM Sensors | Daily SRM Data | SRM Info

Real-Time Data | *Group of Real-Time Stations* | *Daily Data* | *Group of Daily Stations*

SHASTA RIVER NEAR MONTAGUE *(SRM)*

Elevation: 2426' · SHASTA R basin · Operator: CA Dept of Water Resources

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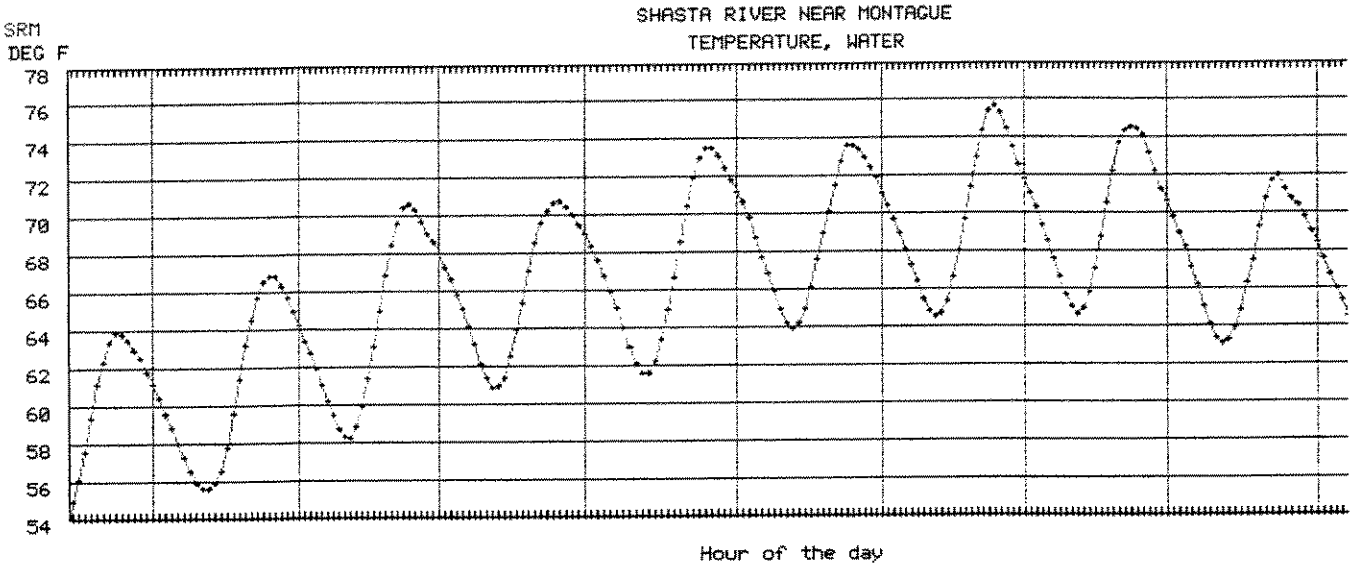


From 10 days ago to now

Real-Time SRM data | Daily SRM data

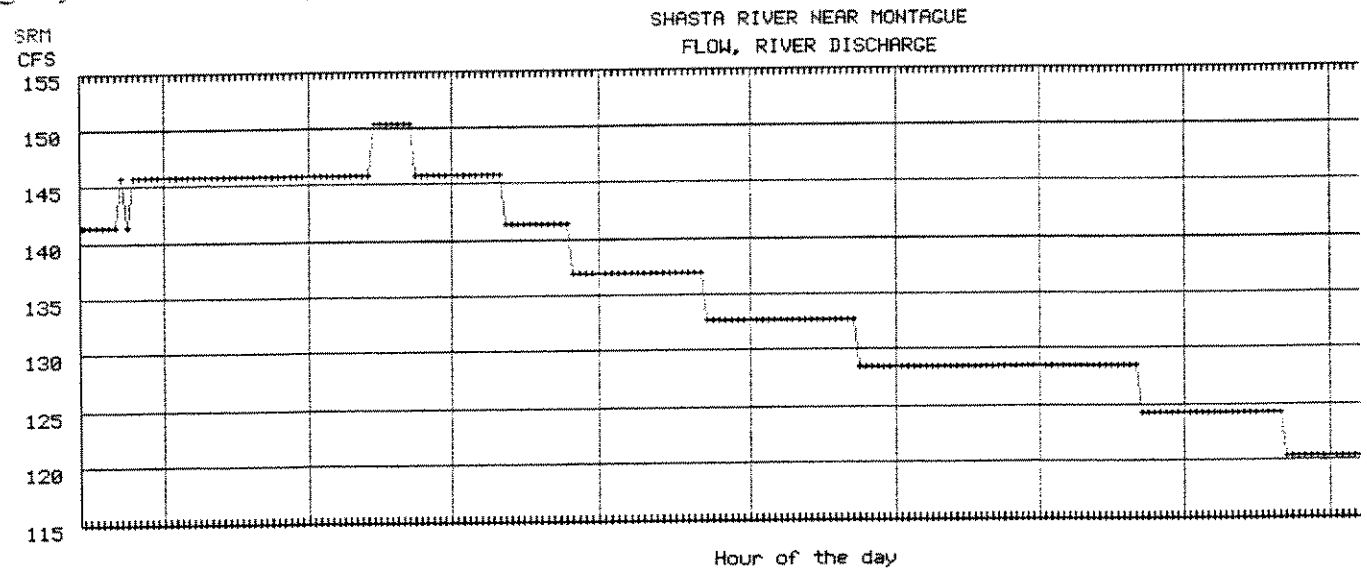
Warning! This has not been reviewed for accuracy. Graphics produced using gd

Real-Time Data | *Group of Real-Time Stations* | *Daily Data* | *Group of Daily Stations*
Monthly Data | *Historical Data* | *Custom Graph Plotter* | *Text Reports*

SHASTA RIVER NEAR MONTAGUE *(SRM)*

Elevation: 2426' · SHASTA R basin · Operator: CA Dept of Water Resources

Query executed Saturday, 05/27/2000 09:12 PDT



From 10 days ago to now

Real-Time SRM data | Daily SRM data

Warning! This has not been reviewed for accuracy. Graphics produced using gd

Real-Time Data | *Group of Real-Time Stations* | *Daily Data* | *Group of Daily Stations*
Monthly Data | *Historical Data* | *Custom Graph Plotter* | *Text Reports*

DRAFT----Matrix of Potential Limiting Factors for the Shasta River (4/11/2000) D

	Direct Limiting Factors	Mouth to Hy 263	HY 263 to Novy's Dam	Novy's to Parks Cr.	Parks to Dwinnell Dam	Lake Shastina	Shasta above Lk Shastina	Yreka Creek	Little Shasta River	Parks Creek	All Other Tributaries	Ranking within Category*
I	**ACCESS TO HABITAT**											
A	Blockage by dams / weir (large & small)	x	x	x	x	x	x	x	x	x		13
B	Blockage by natural barriers related to flow						x	x	x	x	x	2
C	Subadults can become stranded in pools	x						x	x			0
D	Thermal barriers to migration	x	x					x	x	x		9
II	**FLOW**											
A	Low summer flow due to water management	x	x	x	x	n/a	x	x	x	x	x	
B	Low summer flow due to natural conditions	x	x	x	x		x	x	x	x	x	
C	Low winter flows-loss of peak flows					x		x	x	x	x	
D	High winter flows	x	x	x	x		x		x	x		
E	Change in natural storage			x	x	x		x	x	x	x	
F	Change in groundwater storage			x								
III	**WATER QUALITY**											
A	High Temperature	x	x	x	x	x	x	x	x	x	x	20
B	Low Dissolved Oxygen	x	x	?	x	x	?					11
C	pH, alkalinity & conductivity											0
D	Contaminants (including urban runoff & bioaccumulation)		x?				x	x				0
E	Excessive Nutrients		x	x	x	x	x	x	x	x	x	4
G	Turbidity (both organic and inorganic)		x	x	x	x	?	x	x	x	x	0
H	Return flows affect water quality		x	x	x		x	x	x	x	x	7
I	Effect of water quality on eggs during spawning, incubation and in vivo	x	x	x	x					x	x	0
IV	**GEOMORPHOLOGY**											
A	Lack of spawning gravel	x	x	x	x	n/a		x	x	x		8
B	Excessive fine sediment supply	x	x	x	x		x	x	x	x	x	8
C	Coarse Sediment Transport	x	x	x?			x			x?		2
Ca	Coarse Sediment transport (aggradation)	x	x	x?			x			x?		2
Cb	Coarse Sediment transport (redd scour)											
Cc	Lack of Coarse Sediment transport											
D	Maintenance of Dynamic Alluvial Processes	x	x	x	x		x	x	x	x	x	18
Da	Channel shape / stability											
Db	Side channels											
Dc	Aquatic vegetation (stability)		x	x					x	x		
F	Mining effects (tailings piles & dredge mining)	x	x					x				0
G	Absense of Large Woody Debris	x	x?									0
V	**WATERSHED & UPSLOPE PROCESSES**											
A	Land management (conversion of original landscape)											
Aa	Agricultural activities		x	x	x	x	x	x	x	x	x	18
Ab	Timber Management activities						x	x	x	x	x	0
Ac	Public Roads/Railroads impacts	x	x	x	x	x	x	x	x	x	x	1
Ad	Fire Management	x	x	x	x	x	x	x	x	x	x	0
Ae	Water development		x	x	x	x	x	x	x	x	x	7
Af	Housing and Urban Development		x		x	x	x	x	x	x	x	3
Ag	Industrial and Municipal Development		x				x	x				2
Ah	Recreation					x						0
B	Upslope Products											
Ba	Large Woody Debris	x	x	x	x	x	x	x	x	x	x	6
Bb	Gravel quantities (excess)						x	x	x	x	x	12
Bc	Water development		x	x	x	x	x	x	x	x	x	18

DRAFT----Matrix of Potential Limiting Factors for the Shasta River (4/11/2000) D

	Direct Limiting Factors	Mouth to Hy 263	HY 263 to Novy's Dam	Novy's to Parks Cr.	Parks to Dwinnell Dam	Lake Shastina	Shasta above Lk Shastina	Yreka Creek	Little Shasta River	Parks Creek	All Other Tributaries	Ranking within Category*
VI	**BIOLOGICAL INTERACTIONS**											
A	Redd superimposition	x										0
B	Density dependent factors	x	?	?	?							9
C	Predation by native species	x	x	x	x			x	x	x	x	0
D	Exotic species (including fish, snails, molluscs, etc.)	x	x	x	x			x	x	x	x	5
E	Food production											0
F	Smolts blocked to outmigration	x	x			x	x	x	x	x	x	4
G	Parasites	x	?	?	?			?	?	?	?	0
H	Disease	?	?	?	?	?	?	?	?	?	?	0
I	Water quality effects on disease/condition (chronic/acute)	x	x					x	x	x		10
J	Flow effects on disease/condition	x	x		x		x	x	x	x	x	2
VII	**MICROHABITAT LIMITATIONS**											
A	Lack of Depth	x	x		x		x	x	x	x	x	3
B	High Velocity	x										1
C	Lack of Cover	x	x	x	x	n/a	n/a	x	x	x	x	7
D	Substrate	x	x	x	x		n/a	x	x	x	x	14
E	Lack of Holding Habitat	x		x			n/a	x	x	x	x	3
F	Redd De-watering in Spring						n/a		?	?		0
VIII	**STREAM DIVERSIONS**											
A	Entrainment (need to install/maintain screens)	x	x	x	x	x	x	x	x	x	x	5
B	Loss of cold water		x	x	x		x	x	x	x	x	15
C	Effect of diversion on water quality (including temp)	x	x	x	x		x	x	x	x	x	3
D	Return flows affect water quality		x	x	x		x	x	x	x	x	13
IX	**GROUNDWATER**											
A	Impacts of groundwater pumping and spring diversion/utilization on flow		x	x	x	n/a	x	x	x	x	x	12
B	Impact of groundwater on spring flow, river flow and water quality	x	x	x	x	n/a		x	x	x	x	18
X	**ACCIDENTAL MORTALITY**											
A	Scientific investigations											
B	Catch and Release Angling											
XI	**OUT OF BASIN**											
A	Legal harvest											
B	Impacts of hatchery fish (competition, disease, release timing)											
C	Predation											
XII	**THERMAL REFUGIA**											
A	Reduction in amount and quality of thermal refugia		x	x	x		x	x	x	x	?	18

*Ranking relative to topics within the categories. Cannot compare ranks between categories.

SHASTA RIVER HABITAT IMPROVEMENT WORK

Spawning Riffle Projects

Slide Hollow	$94,000
Tire Flat	$92,000
Salmon Heaven & Gillen	$135,000
Yreka Creek (3 Projects)	$78,000
total	$399,000

Fish Ladders

Everret Fiock Dam	$5,000
Norman Fiock Dam	$5,000
Montague Pumps Dam	$5,000
Hart (Little Shasta)	$2,000
total	$17,000

Fish Screens

Soules (Little Shasta)	$11,000
Hart (Little Shasta)	$9,000
Little Shasta	$10,000
East Fiock	$11,000
West Fiock	$12,000
Williams	$9,000
Montegue Pumps	$47,000
Jenkins	$12,000
Grenada Pumps	$30,000
Parks Creek (4 Screens)	$42,000
total	$193,000

Bank Stabilization and Reveg.

Yreka Creek	$7,000
Shasta River (2 Projects)	$27,000
total	$34,000

Studies (recent)

Water Quality Inventory	$24,000
total	$24,000

Grand Total: $667,000**

**Construction costs only. Maintenance of projects is estimated at over $300,000

All of the tasks listed in the CRMP Coordinator Contract for 1999 were both important and necessary to long term progress. Some of the extra tasks undertaken that could not have been predicted in advancemay have been even more important.

The opportunity to meet for several hours with Congressman Herger and his staff came at a critical time when bipartisan support was needed for the presidents Salmon Recovery Initiative. That initiative brought 9 million dollars to California for the year 2000 alone. When meeting with Congressman Herger, we were able to focus on an array of cooperative restoration projects, using the Shasta as an example. That was an opportunity that could not have been predicted, yet was of critical and ongoing importance to salmon coast wide.

Other actions such as arranging the marriage between DWR and BOR for satellite access, securing DWR financial support for outmigrant counting, formation of the sub-committee with many subsequent meetings to do limiting factor prioritization, the initiation of work on TMDL's, etc. all required the flexibility to seize opportunities, and carry them through to completion.

The Klamath River Basin Fisheries Task Force has created the opportunity for these advances by supporting the ground-up restoration work of the Shasta CRMP. Ongoing support of that nature will be critical if that progress is to continue. One needs only look at the short list (attached) of fishery projects done prior to1987 to see what a difference funding focused on developing restoration projects can make.

Summary of Expenditures

A total of $25,000 was available from this grant. Approximately $2,262 was carried over into 2000. An additional $18,477 was available and was spent from the 1998 CRMP grant. The total spent on supporting the Shasta CRMP in developing restoration programs in 1999 was $41,215. See attached budget sheet.

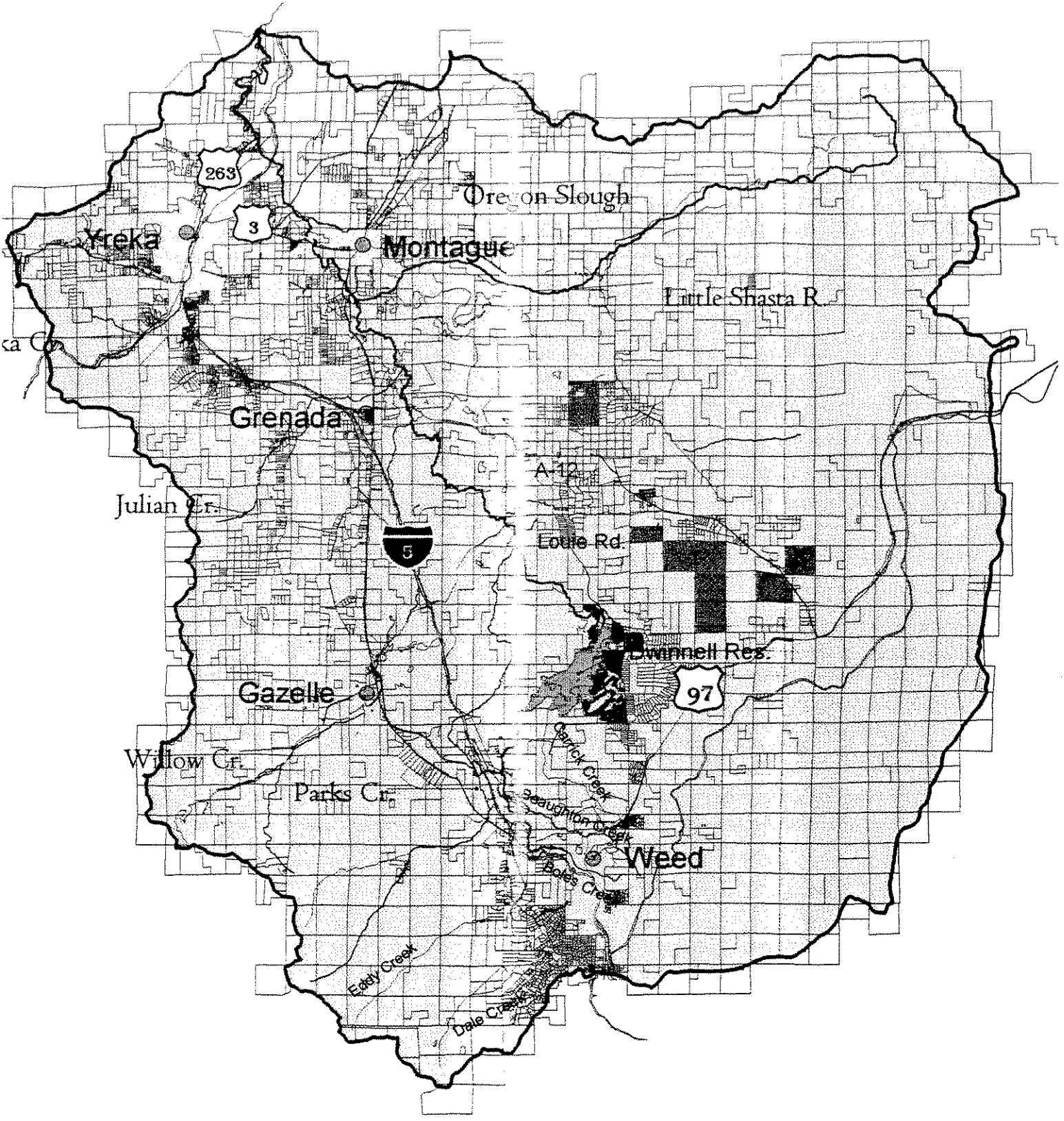
Appendices

1. Watershed map showing outlines of all 13,000 assessors parcels in unincorporated areas of Shasta Watershed.
2. Watershed map showing locations of historic aquatic invertebrate monitoring.
3. List of historic invertebrate monitoring sites.
4. Summary sheets describing historic invertebrate data.
5. Letter and map sent to Calif. Fish and Game Commission re: adequacy of existing fishing closure at mouth of Shasta River.
6. Printouts of DWR web pages with real-time flow data from the watermaster's weir near Montague on the Shasta River.
7. Draft prioritization matrix for limiting factors for salmonids in Shasta River.
8. List of Department of Fish and Game Restoration Projects on Shasta prior to 1987.
9. Sample Newsletter

U.S. Fish & Wildlife - P.O. Box 1006 - Yreka, CA 96097				3017		
CRMP 98-PC-03// #14-48-11333-97-J029						
Contract figures						
	98-PC-03	**1998**	**1999**	**Total**	Over/	
	Budget	**Expenses**	**Expenses**	**Expenses**	Under	
Personnel Costs	$22,505.00	$11,608.11	$16,116.62	$27,724.73	($5,219.73)	
Exp. Equipment/Sppls	$6,400.00	$2,118.94	$608.79	$2,727.73	$3,672.27	
Travel	$0.00	$0.00	$0.00	$0.00	$0.00	
General Administration	$4,086.00	$786.90	$1,751.64	$2,538.54	$1,547.46	
Annual Totals	$32,991.00	$14,513.95	$18,477.05	$32,991.00	($0.00)	
U.S. Fish & Wildlife - P.O. Box 1006 - Yreka, CA 96097				3042		
Shasta River CRMP 99-PC-02/14-48-113339J041 (10/1/98-1/30/00)						
Contract Totals						
	Contract	**1999**	**2000**	**Total**	**Over/Under**	
	Expenses	**Expenses**	**Expenses**	**Expenses**		
Personnel Costs	$17,536.00	$17,887.80	$1,944.91	$19,832.71	($2,296.71)	
Exp Equipment/Sppls	$1,270.00	$1,399.30	$0.00	$1,399.30	($129.30)	
Travel	$2,935.00	$1,384.19	$90.51	$1,474.70	$1,460.30	
General Administration	$3,259.00	$2,067.13	$226.16	$2,293.29	$965.71	
Annual Totals	$25,000.00	$22,738.42	$2,261.58	$25,000.00	$0.00	
Total spent on CRMP support in 1999:		**$41,215.47**				

Shasta Watershed Planning Map

Topic- Assessors Parcels Reviewer Webb



Shasta Watershed Planning Map

Topic Historic Aquatic Invert. Sampling Sites Reviewer Webb

Shasta River Aquatic Invertebrate Monitoring sites

Site ID No.	Description	Location	Notes
1	Shasta Near Edgewood	T42N R5W S20	Historic data site
2	Shasta Below Dwinnell	T42N R5W S25	Historic data site
3	Shasta River and Co. Road A-12	T44N R6W S23	Historic data site
4	Shasta River above confluence with Little Shasta	T44N R6W S3	Historic data site
5	Shasta River below confluence with Little Shasta	T45N R6W S33	Historic data site
6	Oregon Slough at Montague-Ager Rd.	T45N R6W S22	Historic data site
7	Shasta River above confluence with Yreka Creek	T45N R6W S7	Historic data site
8	Yreka Creek at Anderson Grade Rd.	T45N R6W S1	Historic data site
9	Shasta River near confluence with Klamath	T46N R6W S19	Historic data site
10	Little Shasta at Ball Mt. Rd.	T42N R4W S25	Historic data site
25	Shasta Above Big Springs Creek	T43N R5W S8	Historic data site

site	dy	mo	yr	date	day#	time	SW index	size (ft sq)	# of inverts		lab #
LSR at Ball Mt Rd	5	16	73	5/16/73	560	1445	1.3	??	469		79667
LSR at Ball Mt Rd	9	7	73	9/7/73	674	1040	0.91	4	623		83846
LSR at Ball Mt Rd	10	20	77	10/20/77	3174	??	1.41	3	610		n/a
OS near Montague	5	17	73	5/17/73	561	740	1.82	??	176		79672
SR above LSR	5	16	73	5/16/73	560	1350	1.75	??	376		79668
SR above LSR	10	20	77	10/20/77	3174	??	1.69	8	280		n/a
SR above LSR	8	26	81	8/26/81	4569	1100	1.49	8	2730		
SR above LSR	4	28	82	4/28/82	4814	1300	1.29	8	1041		
SR above YC	5	16	73	5/16/73	560	??	1.38	??	715		79671
SR above YC	9	6	73	9/6/73	673	1645	1.22	2	298		83844
SR above YC	4	27	82	4/27/82	4813	1230	1.06	8	818		
SR above YC	7	27	82	7/27/82	4904	1330	1.68	8	913		
SR above YC	8	26	81	8/26/81	4569	1230	1.68	8	4452		
SR above YC	4	18	83	4/18/83	5169	1300	1.47	8	916		
SR above YC	6	14	83	6/14/83	5236	1330	1.81	8	310		
SR below Dwinell	4	16	73	5/16/73	560	1415	0.64	??	417		79675
SR below Dwinell	9	7	73	9/7/73	674	910	1.11	4	885		83847
SR below Dwinell	10	20	77	10/20/77	3174	??	1.61	3	200		n/a
SR below Dwinell	8	26	81	8/26/81	4569	945	0.34	8	3147		
SR below Dwinell	4	27	82	4/27/82	4813	930	0.17	8	485		
SR below Dwinell	7	27	82	7/27/82	4904	945	1.08	8	1212		
SR below Dwinell	4	18	83	4/18/83	5169	1000	0.18	8	1539		
SR below Dwinell	6	15	83	6/15/83	5237	930	0.86	8	2042		
SR below LSR	7	27	82	7/27/82	4904	1230	1.59	8	1420		
SR below LSR	4	18	83	4/18/83	5169	1200	1.34	8	686		
SR below LSR	9	15	83	6/15/83	5237	1145	1.86	8	594		
SR below YC	5	16	73	5/16/73	560	1545	1.54	??	712		79670
SR near Big Springs	5	17	73	5/17/73	561	1350	1.17	??	390		79669
SR near Big Springs	8	26	81	8/26/81	4569	900	1.34	8	1684		

SR near Big Springs	4	27	82	4/27/82	4813	1015	0.97	8	157		
SR near Big Springs	7	27	82	7/27/82	4904	1045	0.81	8	4078		
SR near Big Springs	4	18	83	4/18/83	5169	1000	1.46	8	358		
SR near Big Springs	6	15	83	6/15/83	5237	1015	1.68	8	491		
SR near Grenada	8	26	81	8/26/81	4569	1030	1.47	8	811		
SR near Grenada	4	27	82	4/27/82	4813	1100	1.53	8	1890		
SR near Grenada	7	27	82	7/27/82	4904	1145	1.64	8	181		
SR near Grenada	4	18	83	4/18/83	5169	1130	1.61	8	271		
SR near Grenada	6	15	83	6/15/83	5237	1100	1.69	8	622		
SR near mouth	9	15	71	9/15/71	0	??	1.4	4	64		73273
SR near mouth	6	16	72	6/16/72	225	??	1.36	??	422		74464
SR near mouth	5	17	73	5/17/73	561	??	1.87	3	229		79674
SR near mouth	8	26	81	8/26/81	4569	1300	0.53	8	4944		
SR near mouth	4	27	82	4/27/82	4813	1400	1.87	8	269		
SR near mouth	7	28	82	7/28/82	4905	730	1.5	8	5513		
SR near mouth	4	18	83	4/18/83	5169	1345	1.56	8	1099		
SR near mouth	6	15	83	6/15/83	5237	1415	1.68	8	352		
SR near mouth	9	0	71	9/00/71		??	0.77	4	1046		73274
YC above SR	5		73	5/16/73	560	??	1.18	??	245		79673
YC above SR	9		73	9/6/73	673	1140	1.16	4	1129		83845
YC above SR	8		81	8/26/81	4569	1200	1.61	8	1177		
YC above SR	4		82	4/27/82	4813	1200	0.6	8	83		
YC above SR	7		82	7/27/82	4904	1710	0.63	8	13427		
YC above SR	4		83	4/18/83	5169	1245	1.12	8	194		
YC above SR	6		83	6/15/83	5237	1300	1.34	8	1611		

Shasta CRMP
PO Box 459
Montague, CA 96067

March 18, 1999

California Fish and Game Commission
1416 Ninth St.
Sacramento, Ca

Greetings,

The Shasta CRMP has been working on fishery restoration measures in the Shasta Valley since 1991. Our primary focus is on land management practices in the Shasta Valley itself, but we also provide imput in other areas of fishery management as it affects our success.

We understand that you have begun your process of review of salmon regulations. We would like to make the following observations and suggestions:

1. During this past season, sport fishermen informed us that apparently significant numbers of egg-bearing female Fall Chinook were being caught at lengths less than the 24 inch cut-off line separating 2-year-old from older fish. It appears that growth rates in the ocean were not what had been hoped for, causing significant numbers of three-year-old Fall Chinook salmon to return at less than 24 inches.

This reduced growth problem was compounded by recent changes to the sport fishing regulations that this year increased the cut-off line between two-year-olds and adults from 22 to 24 inches.

We believe that the cut-off between two year old and adult salmon needs to be reduced to no more than 22 inches, possibly less.

Low growth rates tend to coincide with periods of low survival. Hence years in which three-year-olds are undersized are the worst possible times to lose natural spawners. The increasing likelihood of ESA listings requires that a consistently more conservative approach be instituted for protection of wild stocks.

In addition to the above length change, we feel that the role of the two-year-olds should be re-examined. It appears to us that they can be an important component of the spawning population, particularly where low flows make passage difficult for larger male fish. It may not make sense to allow an unrestricted harvest of them based on the assumption that they do not spawn.

Finally, in years when water temperatures are high, there may be a substantial delayed catch and release mortality of adult salmon from people fishing for two-year-olds, again impacting adult spawners.

We would like the entire subject of unrestricted two year old salmon harvest to be re-examined using best available data on two year old spawning, Klamath River water quality data, effect of

Klamath River temperatures on catch and release mortality, and the consequences continued failure to rebuild salmon numbers in light of the federal Endangered Species Act.

2. Several years ago the Fish and Game Commission wisely closed the mouths of the Shasta, Scott and Salmon Rivers to fishing, in an effort to protect dwindling natural runs. Additional data gathered since then , from both habitat typing done by the USFWS and aerial reconnasiance by Dr. Hiram Li indicates that for the Shasta that protection is not adequate, and needs to be extended.

The existing 500-foot closure includes only a small a pool at the mouth of the Shasta which is less than six feet deep. It is too small to hold the numbers of fish that are often waiting in the Klamath for conditions in the Shasta to be favorable (see graph from DFG Biological Needs Assessment, Shasta Watershed plan, along with second graph from DFG records at the Shasta Racks).

In addition, in those years when September water temperatures are too high for the salmon to enter the Shasta, the water in the pool immediately downstream of the Shasta is also going to be too high for them to stay (see map and data from Dr. Hiram Li).

The net result is that there are no adequate protected holding areas in the Klamath for fish waiting to return to the Shasta.

Here again, the looming risks of ESA listings demand that all reasonable measures be taken to protect natural stocks at risk.

The nearest suitable holding areas downstream of the Shasta are approximately 6200 feet downstream, just above the mouth of Long Gulch. A closure to that point would be easy to describe and recognize, either from the road (HY 96) or the Klamath River, facilitating compliance.

We believe that fishing needs to be closed in the Klamath River from the Highway 263 bridge just upstream of the Shasta River mouth, to Long Gulch, 6200 feet downstream, to provide suitable deep pool resting and holding areas for salmon needing to return to the Shasta River.

We have included a map showing the Klamath River below the Shasta, with instream habitat types mapped using data collected by the USFWS.

For comparison, we have included a map of the Klamath below Iron Gate Dam where the existing closure is 3500 feet long in order to protect the hatchery stocks.

Natural stocks now need greater protection than that long afforded to hatchery stocks.

3. Finally, we would like to request a clarification of harvest numbers reported annually by the DFG in its Klamath River "megatable". There is no specific entry for Karuk harvest. Is it included in the sport harvest numbers, or is it not reported at all?

If it is not reported, how are salmon allocated for this fishery?

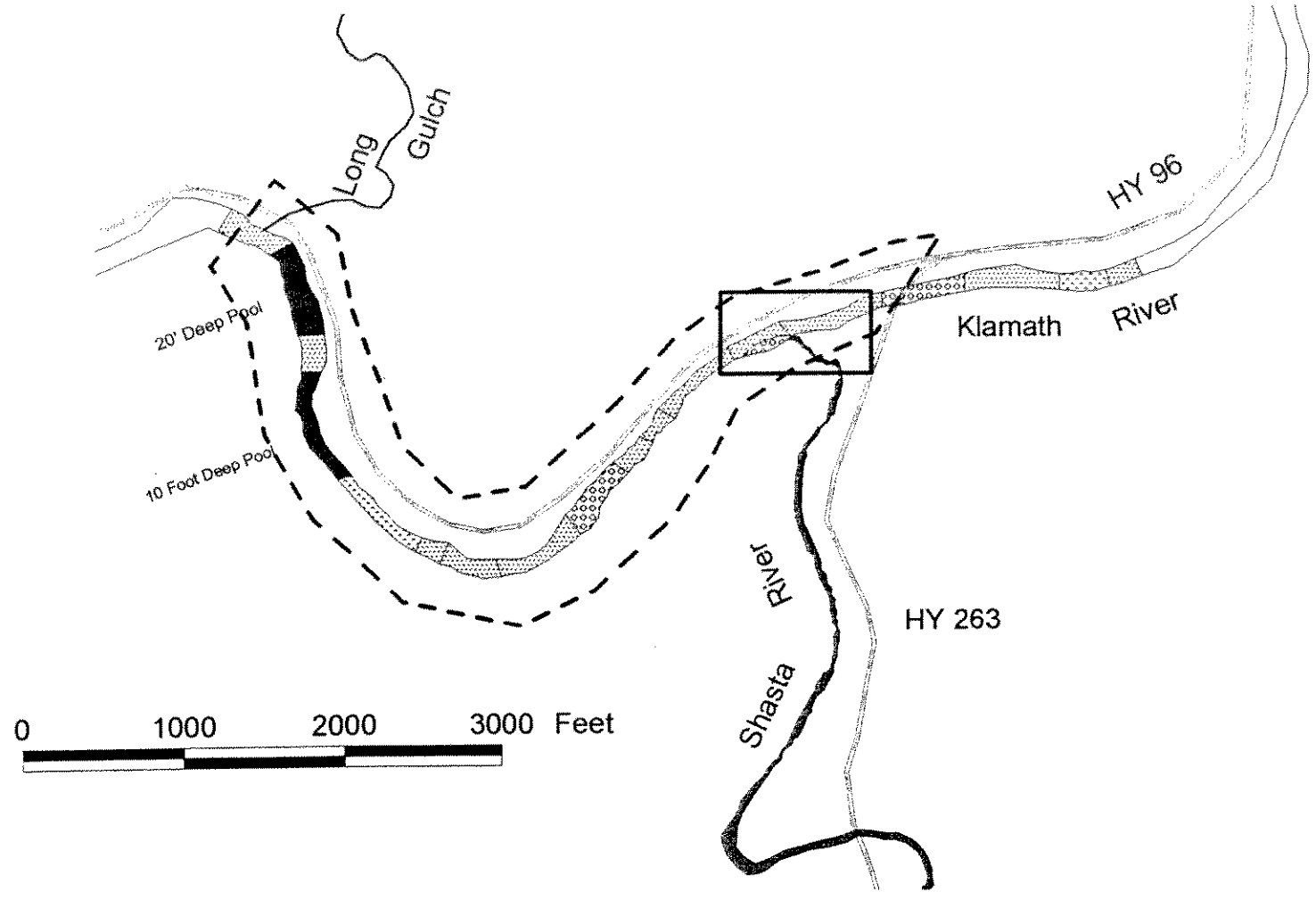
We would appreciate a written response on these three areas.

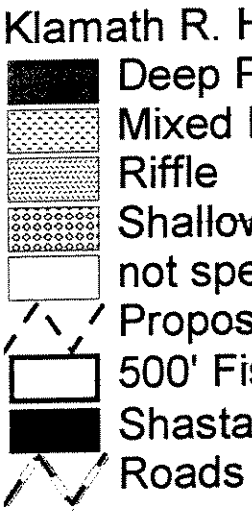
Thank you very much.

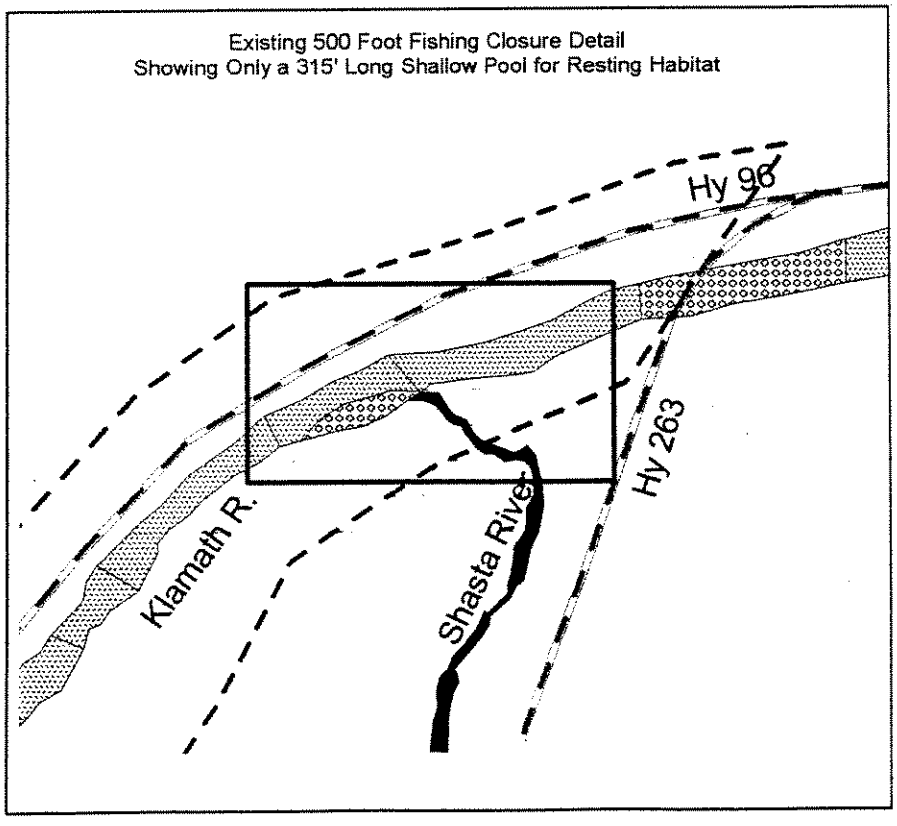
Sincerely Yours,

Blair Hart,
Chairman, Shasta CRMP

Potential Resting Habitat for Shasta River Fall Chinook







March, 1999

Shasta River CRMP Newsletter

Protecting Landowners By Saving Fish

This newsletter marks a major shift in efforts for the Shasta Coordinated Resource Management and Planning (CRMP) group. Until now, we have mostly involved just the people and land immediately bordering the main Shasta itself. It's past time that we add more of the other people in the Shasta Valley who also have an interest in the river and its water. Our first step in that direction is to add to our mailing list each person in the irrigation districts in the Shasta Valley, and invite each of you to participate in our meetings.

Coordinated Resources Management and Planning is a general approach people can use to work voluntarily together on to solve shared problems. Generally, CRMPs work on natural resources conflicts that involve people from a variety of backgrounds and with different goals. A CRMP group gives those people an opportunity to discuss natural resource problems. As they come to understand each others' needs, they often can find common ground for resource-related improvements. No matter what, everything is voluntary, and the CRMP has no legal authority, nor will it attempt to force anyone do anything.

In the case of the Shasta River, the CRMP process focuses on water and salmon. Unfortunately, there is often not enough water to easily meet everyone's needs. And the quality of the water in the river is not what many people (or fish) would like. Somehow, we as neighbors must find ways to meet each others' needs. The Shasta CRMP is committed to finding win-win solutions.

The Shasta CRMP was started by local ranchers in 1991. Since then we have reached a good understanding of the problems to be solved: (1) not enough water to meet all needs in some years; (2) water that gets too hot for salmon to survive; (3) water that contains too little dissolved oxygen for salmon to survive; (4) too much good soil going down the river; (5) not enough logs, roots, and sticks trailing in the water to give small fish a place to survive; (6) physical hazards in the river that can reduce salmon survival, including dams, unscreened diversions, and fish-handling operations.

These problems are the collective unintended result of many good people in the Shasta Valley and elsewhere trying to make a living. Any solutions devised must include the opportunity for those people to continue to make their livings.

We also have to recognize that the primary reason for conflict is that our neighbors downstream or on the Coast are no longer able to make a living because there aren't enough fish. We have to find ways to provide both irrigation water and fish. It isn't easy, and it hasn't been quick. By working together we will find ways to make neighborly choices.

Photo: Ray Oscar

An improved fish screen and pump for Bruce and Boyd Fiock. Tim Louie running the excavator, Jim Whelan in the water (Summer '98).

Notes From The Shasta

CRMP Coordinator, Dave Webb

Pulsed Flows

Well, here we are, nearly April 1 and practically the start of the irrigation season. At least it looks like another wet year. But, just in case it's not, we've begun preparing for pulsed flows in the Shasta.

As most of you remember, back in 1993 we started using pulsed flows to encourage salmon to hurry their outmigration towards the ocean. Our concern is that if they linger in the Shasta or Klamath too long, they are likely to die when water temperatures climb in the early summer. By stopping irrigation use of the river for a few days and by removing the flashboard dams, we can create the appearance of a spring freshet, which seems to be quite effective at encouraging the young salmon to move downstream.

I have already contacted the major irrigators who must hold public meetings—Montague Irrigation District, Shasta Water Association, and the Grenada Irrigation District. Each is ready to participate if river conditions warrant. As we move into the irrigation season, I will be contacting the owners of the flashboard dams along with other irrigators along the river, to ask for their support and participation.

Our current targets for two pulsed flows are about May 10th and the first week of June. We'll keep you posted.

Photo: Ray Oscar

Mike Deas from UC Davis, Dave Webb, and Bruce Fiock at a dam the Fiocks share with other water users near Hwy. 3.

Local River Monitoring Station for Your Use

For several years the Shasta CRMP operated a river monitoring station in the Shasta River near Montague. It's there for all of you to use, so you can keep tabs on air and water temperatures and flows. Call, listen to the current conditions, and keep an eye on your river. The number is 459-0416.

For those of you with computers, you can also contact it via modem and download stored data, including air and water temperatures, conductivity, gauge height, and solar insolation. If you are interested, call Dave Webb at 926-2460. He will get you set up with the right program.

Erosion Concerns

Over the last two months I have been near the mouth of the Shasta several times. I noticed during the last two high water periods (Jan. 22-23, and Feb. 7, 1999) that the river was pretty muddy. On my way home both times, I stopped at A12 to see what the river looked like there. Even though it was beginning to come out of its banks, it was pretty clean. It was apparent that a lot of soil was getting into the water column between A12 and the top of the canyon where Highway 263 crosses the Shasta just north of Yreka. I probably should have stopped at every road crossing and tried to divide the river into short lengths, but it was late, and I expected the water would be muddy all the way to Parks Creek.

Of course I wasn't able to tell if the river was actively eroding someone's stream bank or just picking up fine materials that had settled out on the bottom during the summer. In either case, it looked like landowners somewhere below A12 had lost a lot of good soil either from sheet erosion from their fields or by losing chunks of bank along the stream. Some of it, of course, could also have come down Yreka Creek or the Little Shasta.

Fine sediment (soil) in the water can create problems for salmon by settling out into spawning gravel and killing the eggs. Loss of fine sediment can cause problems for landowners, since it means that productive soil is going down the river.

It looks like everyone might benefit if we could find ways to reduce the erosion. I'll try to report back after the next high water.

It's A Date Page

Up-coming events for your calendar...

Range and Ranch Water Quality Workshop

COMING YOUR WAY...an informative session on the RANGELAND WATERSHED PROGRAM.

The session will focus on the development of the California Rangeland Water Quality Management Plan, what's in it for you and how to get one!! An informational meeting is scheduled at the **Greenhorn Grange on March 30th at 7:00 p.m.** Actual workshop dates will be determined after the March meeting. Watch for publicity or call your Shasta Valley Resource Conservation District at 842-6121 (endorsed by the California Cattlemen's Association).

A very successful course was recently taught in Scott Valley by Dan Drake of the UC Extension Office and Randy Seelbrede of the Natural Resource Conservation Service. Twenty ranchers and land owners have participated. They were given soil maps and aerial photos to begin the two-evening course. Participants looked at the possible effects of their management practices on water quality. Since the state-level approval of the California Rangeland Water Quality Management Plan in 1995, the livestock industry and rangeland owners and managers are now implementing the plan locally. We still have an opportunity prove that *voluntary compliance* is a viable alternative to *regulatory* prevention of nonpoint source pollution. The plan provides for three approaches to voluntary compliance: Letter of Intent, Nonpoint Source Management Plan, and a Recognized Nonpoint Source Management Plan. Voluntary compliance is the first of three options for achieving water quality goals. If voluntary compliance is unsuccessful, the Regional Water Quality Control Boards have the authority to invoke the more stringent options. It's now time for all local ranchers and landowners to get their management strategies in place. Dan and Randy are prepared to answer your questions about your available options.

Members of the **Shasta River Water Association, Grenada Irrigation District,** and **Montague Water Conservation District** are encouraged to attend the next CRMP meeting. At this meeting water district members can personally interact with their neighbors and will be able to discuss water issues in the Shasta Valley. In the meantime, readers are all encouraged to contact CRMP with questions and concerns about the future and how you can help yourselves through efforts to restore the Shasta River.

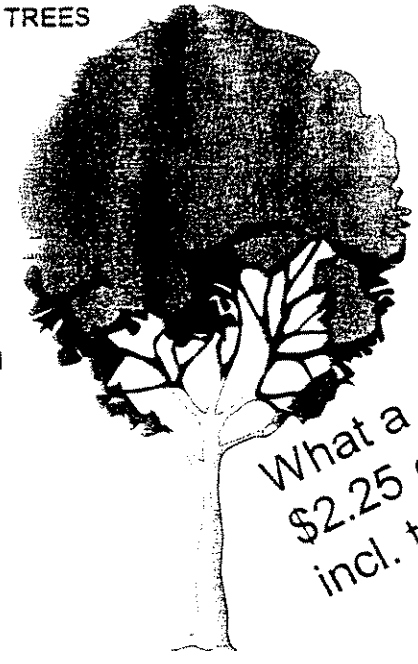
Shasta River CRMP 1999 Quarterly Meetings

4th Wednesday @ 7:00p.m.–May 26, Aug. 25, Nov. 24
meeting site varies, for info call Dave Webb 926-2460

TREE SALE

DECIDUOUS TREES

Black Locust
Bur Oak
Column Poplar
Crab Apple
Golden Willow
Green Ash
Hackberry
Hybrid Poplar
Lacebark Elm
Russian Olive



EVERGREEN TREES

Arizona Cypress
Austrian Pine
Baker Cypress
Incense Cedar
Jeffrey Pine
Sequoia Redwood

SHRUBS

Bush Honeysuckle
Caragana
Chokecherry
Cotoneaster
Desert Peach
Golden Currant
Lilac
Nanking Cherry
Sand Cherry
Serviceberry
Sumac
Wild Rose

What a deal! $2.25 each incl. tax

Plants are fully-rooted in 1 qt. containers. Minimum order is 10 trees or shrubs. **All plants must be ordered and prepaid by March 26.** Information packets are available for pick-up at the NRCS (SCS) office at 215 Executive Ct. (behind Blue Goose station) in Yreka, or call 842-6121 ext. 117. A portion of the sale proceeds is donated towards a scholarship for a local high school student. Trees will be available for pickup April 9-10 only.

A New Restoration Program on Our Horizon?

For the last 8 years, the Shasta River CRMP has been working with landowners along the Shasta with two goals: 1) restore the salmon and steelhead productivity of the Shasta River, in order to 2) protect the existing land uses in the Shasta Valley.

During that time we have regularly pointed out to state and federal agencies that accomplishing goal #1 will require much more in terms of buffer strips and effort than the few people living along the river could afford to give the rest of society for free.

At last, the federal government has finally decided to expand the 15 year old Conservation Reserve Program (CRP), which many local people have enrolled through the ASCS office, to include a special program called the Conservation Reserve Enhancement Program (CREP). It has two key provisions that are important to us: 1) It can be defined locally to deal with local needs; and 2) it allows for land rental rates to be set locally.

Any of you who looked into the CRP in the past no doubt quickly realized that you would only be paid about ten cents on the dollar if you wanted to set aside productive land. And, of course, most of you decided that you couldn't afford to do that.

We have been working with interested landowners from the Shasta and Scott Valleys to define a CREP program that will actually create an incentive for people to protect water quality and fish habitat.

By "incentive" we mean payment of real, free-market pasture rental rates for the land set aside as buffer strips along rivers and streams, along with additional compensation for any extra management those buffers may take. Our goal in this program is to make it a sound economic decision to protect water quality and fish habitat.

We should have a draft ready for wider review soon. We'll then submit our proposal to Washington and Sacramento for approval. We're optimistic! Look for more information in our next newsletter.

goldfish! A seven inch long piece of gold in the shape of a fish was found on the Scott River on January 27, 1855, by James Lindsay and T. L. Wade. It weighed 187 oz. and was worth $18.74 per ounce. The "fish" would be worth about $54,230 today.

The Shasta River CRMP is an organization of landowners in the Shasta Valley. Public input is vital. "CRMP serves the Shasta Valley watershed from the mouth of the river to south county. We're all neighbors and we can help each other! Come to our meetings and share your ideas, comments, questions, and suggestions."

Shasta River CRMP Newsletter
Coordinated Resource Management Planning Council
c/o 215 Executive Court. Yreka. CA 96097

Water usage in the Shasta Valley

Before about 1850, residents of the Shasta Valley were content with the rivers and streams however nature chose to present them from year to year. With the discovery of gold, and the subsequent immigration of new residents, all that began to change.

The first changes were in the form of the diversion of streams for use in washing gold from the soil around Yreka. Because of the climate, the available water supply rapidly proved to be inadequate to meet local demand, and soon a ditch (the Yreka Ditch) was planned and constructed from the headwaters of the Shasta over a distance of 90 miles all the way to Yreka. Substantial additional efforts were expended in attempting to de-water the Yreka Creek alluvial plain from Yreka downstream to allow mining access down to bedrock, often 40 feet below the surface. A ditch (the Antonio Ditch) was dug from near the present HY 3 crossing of the Shasta River, all the way to near Hawkinsville. Smaller ditches can be found through the Shasta Canyon, where they were used to wash soil from bedrock to access gold deposited there.

None of those mining ditches served their design function for very long. The gold played out, and people found that more reliable income could be generated by ranching and farming. Many of the mining ditches were converted to irrigation ditches, and dozens of new ditches were dug, allowing crops and livestock to be successfully raised throughout the Shasta Valley. This process of development continued steadily until about 1930, when apparently much of what could be done by way of water development had been done. 1930 did not end efforts at expanding irrigated agriculture, but changes since then have been on a much smaller scale.

Irrigation methods in the Shasta Valley

Early white immigrants found the Shasta Valley to be essentially a vast, dry, treeless plain. From their perspective, most of it was usable only in the spring, when soil moisture supported the growth of grass that could be used to feed horses, cattle and sheep. Once summer arrived, the carrying capacity of the land fell off rapidly, and livestock either moved to the very limited riparian areas, or had to be moved to the mountains where spring arrived later, summers were cooler, and precipitation and soil moisture could provide feed through the summer. Successful ranching required either a balance of low lying ground in the Shasta Valley for winter and spring use, and mountain pastures for summer and fall use, or else a mixture of irrigated and unirrigated ground that could provide a combination of pasture and stored hay for the entire year. Since available mountain pastures were extremely limited, the need to develop irrigation systems became intense.

How people irrigate is determined by several factors, including whether or not water is available from a sufficiently higher elevation to allow it to distribute itself by gravity (allowing flood and furrow irrigation), soil porosity, which may dictate the use of sprinklers, availability of electricity or other source of power, and the nature of the crop grown.

Early irrigation systems were constrained by lack of available power, so were entirely dependent on gravity for the movement of water[1]. The oldest ditches and the oldest water rights all are for flood irrigation, where water is forced out of the stream channel, generally by constructing a seasonal dam in the river or stream to raise the level of the water, then allowing some or all of the stream to run down a ditch that runs downhill with as little a slope as possible[2]. Gradually the ditch is directed away from the river in order to minimize its slope. Given sufficient length, there eventually can be a large area that is downhill from the ditch, where water can be let out of the ditch and run across the ground to keep crops green through the summer. Ditches constructed for this purpose start with a single large ditch, which eventually forks into increasingly smaller ditches to allow the water to be spread as uniformly as possibly over as much ground as possible.

Not all flood irrigation systems are entirely driven by the force of gravity. More recent systems often utilize a pump to lift the water out of the river, and discharge it into a ditch at a much higher elevation than the source of the water. The water is then distributed via conventional flood irrigation techniques.

Flood irrigation completely saturates the upper layers of soil with water, displacing oxygen in the soil. If done continuously, only plants tolerant of anaerobic conditions—sedges, rushes and similar wetland plants could survive[3], so irrigation is done intermittently, generally every two to four weeks. Ideally, sufficient water[4] is applied to wet (not saturate) the upper two feet or so of soil. That water is then available either for use by plants, or it can be lost to evaporation. If too great an amount of water is applied, it is likely to either run off the surface and be lost (known as irrigation tailwater)[5], or soak in deeper than the effective root depth of the plants. In either case, nutrients that could have been available to the growing plants tend to be washed away, along with soil in the case of surface runoff.

The biggest advantage of a gravity powered irrigation system is that once the infrastructure—dam and ditches—are in place, the out of pocket costs of operation are the lowest of any managed irrigation system. The disadvantages include diminished productivity during those periods of each irrigation cycle when soil oxygen is displaced, difficulties in effectively and uniformly distributing the water, and the necessity for ditch and dam maintenance. (Ditch maintenance especially can become extremely burdensome

[1] A few old systems did exist that utilized dip wheels to lift the water to a sufficient elevation to allow it to be used on fields near the river, but their capacity was small, and all have been replaced with other methods or long since abandoned.
[2] Generally 1-2 inches per 100 feet.
[3] These plants generally are slow growing and of such low nutritional value that substantial effort is made to minimize their presence.
[4] The quantity varies considerably, but 4
inches is probably a good average amount applied per irrigation cycle.
[5] Unfortunately, the creation of tailwater is inherent in the use of flood irrigation. Roughly 25% more water than the plants need must be applied to provide the "push" required to move water across the field in a timely fashion. That water can be either captured for further irrigation use, or allowed to return to the stream.

if the ditch is long). This form of irrigation is little changed from the practices utilized by the ancient Egyptians, Romans, Mayans, etc.

More recently, the effects of irrigation runoff on water quality—by bringing nutrients, sediment and heat back to the river—have been added to the list of disadvantages inherent to flood irrigation. The magnitude of those "costs" has not yet been fully defined[6], nor is minimizing those costs yet fully integrated into many water managers irrigation planning. Once those costs are fully defined, flood irrigation may no longer be the cheapest form of irrigation.

The other commonly used form of irrigation in the Shasta Valley is sprinkler irrigation. Sprinkler systems generally consist of a buried mainline to distribute the water, and a movable sprinkler or series of sprinklers aboveground[7].

The mainline may run along the edge or center of the field, with periodic openings that can be connected to the surface sprinklers and turned on or off, or may run to the middle of the field, and connect to a center pivot system (see below).

The simplest system consists of a pump to pressurize the water, and a very large sprinkler called a "big gun", which is essentially a giant Rainbird type sprinkler. It can be towed from place to place, and connected to a main distribution line, and then sprinkles a large circle. The disadvantage is the necessity of frequent moves to irrigate a large area, and the fact that the area it irrigates is round, while most fields are rectangular. The advantage is relatively low initial cost, and system simplicity. Properly managed, a big gun system should not produce significant tailwater.

The most basic system of movable pipe with multiple sprinklers include "hand line" (a series of individual irrigation pipes generally 30 feet long with Rainbird type sprinklers installed intermittently) that slide together during use, and which can be easily separated into individual pipes for moving. Hand line must be picked up, moved and plugged together in steps the full length of a field, and is connected to a valved outlet in the mainline at each step. The hand line is left with the sprinklers running at each step long enough to apply sufficient water to meet the plants' needs, along with anticipated evaporation losses. Once the full length of the field has been irrigated, all the individual hand line joints of pipe with attached sprinklers must be picked up and moved back to the start and the whole process repeated. This must go on throughout the summer.

Hand line has a low initial cost, and will irrigate rectangular areas effectively, but the obviously high labor costs make it uneconomical except for relatively short-term use or for very small fields.

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[6] The workings of the federal Clean Water Act, with its required allocation of total maximum daily loading (TMDLs) and the federal Endangered Species Act, with the necessity not to impair further the habitat of listed cold water fish, will force the cost of irrigation runoff to be defined in the near future.

[7] Completely buried systems, with distribution lines feeding sprinklers that are permanently installed as is common in residential lawns, golf courses and similar situations are generally found to be cost prohibitive for most agricultural uses in the Shasta Valley.

The next step up from a hand line is a "wheel line". With a wheel line, up to several hundred feet of pipe made up of individual sections with sprinklers attached stays in one piece, and is rolled across the field on wheels that are integral to the joints of pipe. Like hand line, a wheel line is moved across a field in a series of steps, and is connected to a buried mainline at each step, then left with the sprinklers running until it is time to be moved again. At the center of each wheel line is a gasoline motor that provides the power needed to roll the whole assemblage across the field.

Wheel lines have higher initial costs, but one person can manage a fairly large system alone.

Center pivots are the last form of sprinkler irrigation with multiple sprinkler heads. Center pivot systems consist of a long arm (up to ½ mile long) made up of individual sections on wheels. One end of that arm connects to the water supply pipe in the ground with a rotating joint. The wheels in each section are powered, and their speeds are individually set to allow the entire arm to move in an arc[8]. Likewise, each individual sprinklers must release an increasing amount of water as they get further from the center of the circle in order to apply an equal amount to each square foot of ground.

Center pivot systems are generally sized to run continuously through the entire irrigation season. By the time one entire rotation is completed, it is time to start over. They can also be designed to sweep through less than a full circle.

The main disadvantage to all sprinkler systems is the requirement that the water be pressurized in order to allow the use of sprinklers. Electrical costs can become substantial, particularly if the source of water is from wells which incur additional electrical costs to lift the water from below ground level. A second disadvantage is that in dry and windy areas, significant amounts of water can be lost to evaporation before it even reaches the ground. Maintenance can also become an important consideration, particularly with center pivot systems, where complex computer control systems and variable drive systems are essential, and potentially beyond the maintenance capabilities of many operators.

The benefits of sprinklers include the ability to irrigate ground too irregular to irrigate using flood irrigation, increased productivity because the soil oxygen is not displaced, and in most cases, less water is required both because it can be applied more uniformly, and because electricity, gasoline or the irrigator (rather than a 25% excess application as with flood irrigation) provides the "push" to distribute it. A well-managed sprinkler system also does not create tailwater.

The last form of irrigation found in the Shasta Valley is drip systems. Drip can be used only on plants that are growing in rows or that can otherwise be watered on an individual basis. It cannot be used to irrigate pastures, where the plants needing water form a

[8] Because the circumference of the circle each wheel must travel increases with distance from the center, the wheels that are located furthest from the center must be turning much faster than those near the center of the circle in order for the entire assemblage to complete an entire circuit in the same amount of time.

continuous cover on the ground. While drip irrigation is used here on some small commercial orchards, it is unsuited to most of the crops that can be economically grown in the Shasta Valley.

Value of water for irrigation

Irrigation water meets a variety of needs, ranging from aesthetic (keeping the property green) to cultural (economically a given landowner may not have to raise livestock, but he or she wants to and it does supplement their income) to economically essential (full time ranchers who must grow enough grass during the summer to feed their livestock through the entire year). What water is worth in each of these instances is difficult to state with certainty, since the decisions and valuations are made on an individual basis. The most reliable index of the value of water is probably to look at what it sells for (delivery costs) within the irrigation districts, and try to see at what point in the pricing structure demands change. This approach is complicated by the various methods used by each of the districts to bill for water. They include:

Grenada Irrigation District has a two tiered payment system—"stand-by" for persons who do not want to pay for water, and "regular", for those persons who want irrigation water for the entire summer. Payment is not optional—this is a property tax based district, and failure to pay the assessment eventually would result in forfeiture of the land. The charge assessed for "stand-by" as nearly as possible reflects the fixed overhead cost of maintaining the infrastructure—employees, pumps, ditches, buildings, equipment, etc. The "regular" fees also include the cost of the electricity required to lift the water from the river, and discharge it into the distribution ditches. These fees are adjusted each year, depending on anticipated costs, and whether or not costs stayed within budget the preceding year.

Irrigation rotation periods vary each year, from perhaps 12 to 20 days, depending on how many landowners decide to irrigate in a given year. Irrigation cycles approaching 20 days are considered to be too long for maximum production.

In any year, each landowner has to weigh the "cost with no benefit" afforded by opting for standby, against the value or cost of water for irrigation. Irrigation potentially entails additional costs in terms of labor for the maintenance of individual ditches, and the distribution of water into the fields from those ditches. Water can be and is delivered at any time of the day or night, making management difficult for persons working jobs in town. The cost of the water and labor is offset either by the value of the forage produced and used by the landowner's livestock, or in the form of pasture rental to someone better able to utilize the land and water than the owner is. Pasture rental does not always equal or exceed the out-of-pocket costs of the "regular" charge for receiving water, leading some people to choose "stand-by" and others to irrigate at a loss. Stand-by costs tend to be around $45/acre, while costs to irrigate total over $105/acre each year. Increasing power costs will push this cost up.

The Grenada District is relatively far from the Shasta River, and the soils are sandy, with the result that little if any water returns to the Shasta as surface tailwater. The Grenada Irrigation district provides water for the irrigation of about 1300 acres.

Shasta Water Association is a farmer owner cooperative, with each landowner holding shares entitling them to part of the available water, but also obligating each of them to a proportionate share of the costs, whether or not they take water. Water is then distributed on a per share basis, every 12-18 days. Costs per share are set every year at a level that will equal the anticipated operating costs for that year, plus any deficiency that might have been carried over from the previous year.

As with other irrigation districts in the Shasta Valley, the water in the Shasta Water Assoc. can be delivered at any time of day or night, and cannot be deferred until later, again making effective utilization difficult for persons working in town. Sub-division of lands within the district has compounded utilization difficulties by splitting parcels from distribution ditches, and requiring that water to some be delivered by flowing overland across fields that were once continuous, a situation that requires ongoing good relationships between neighbors.

Soils within the Shasta Water Association are often both shallow and sloping, limiting opportunities for land leveling or other management measures that would improve the efficiency of water utilization, and resulting in a tendency in parts of the district for the increased creation of tailwater. Persons outside the district, but downhill of it, often come to rely on this water to meet their irrigation needs, but not all water leaving the district can be captured for re-use at the present time. Costs within the district tend to hover around $50-60/acre/year, but again will rise with increasing power costs. The SWA provides irrigation water to roughly 4,200 acres

Montague Irrigation District (MID) operates the closest to a free market system. Landowners within the district are each entitled to a share of the available water (based on irrigable acres) at a baseline cost, and can buy supplemental water at a higher cost (if it is available). Depending on the quantity of water stored in Lake Shastina, the MID directors set the base and supplemental water costs high enough to cover their anticipated costs for the year. Stand-by charge for no water is roughly $1.50/acre /year.

Some years this cost is low enough that the landowners within the district are reasonably well compensated for the costs and labor involved in farming and ranching, and some years the costs of water are too high, resulting in substantially reduced ranch income. High costs result from drought years, when the fixed costs of operating and maintaining the irrigation district must be covered by the relatively small amount of water sold.

Landowners can be faced with the difficult choice of not irrigating at all in years where the prices are too high, but then having to buy feed, liquidate their herds or have essentially no farm income, or cause a permanent pasture to die due to lack of water and have to be reseeded the next year. Pastures which need to be reseeded generally cannot be grazed or harvested for at least two years. Given these choices, most landowners are

forced to purchase water even when the cost is ruinously high, in order to maintain the future productivity of their fields. Four to five years of high water costs results in a large increase of forced sales and foreclosures of farms.

Pricing: Lowest costs in the last 10 years: $12/acre-foot
Highest cost of water in last 10 years: $20/acre-foot
The MID provides irrigation water to roughly 5,900 acres.

While water costs of $20/af are apparently ruinously high in the long run, when water is priced at that level water users find it practical to manage their water much more carefully than they do at $12/af., indicating that there may be water management measures that are not viewed as cost effective at $12, but that are worthwhile at $20. Conversely, managers may be underwatering their crops, and forgoing maximum production in favor of reduced water costs. Probably a combination of both is occurring. The creation of irrigation tailwater varies somewhat with the price of water also.

The MID also supplies domestic drinking water to the city of Montague.

Water requirements of plants

Regardless of the method used, plants have definable needs for water needed to achieve maximum growth. Those plant needs, added to any water losses that occur before or after the water reaches the plant, equal the application needs of the landowner. Different crops have different water needs, just as they have different soil and temperature needs. The climate of the Shasta Valley is the primary determinant of what crops are possible. The relatively short growing season, coupled with very low winter temperatures and long distances to markets or processors means that most of the row cropped vegetables grown in the Central Valley are either not possible or not economically competitive. Exceptions include garlic, potatoes, and strawberries for rootstock. One recent arrival to the area is trying to grow lavender. The fact that very few people attempt any of these crops indicates either an economic problem with them, or a marketing bottleneck.

What is left are the crops that can be reliably grown and either marketed or used by the grower for a known cost—grass and alfalfa hay, grass pasture, and grain, mostly wheat or barley. Estimates of plant water needs[9] for this general area are:

[9] Water needs include transpiration, and evaporation form the soil. It does not include losses in conveying the water to the point of use, nor does it include losses to deep percolation.

Crop	Average H2O Req.[10]	Observed Consumptive use[11]
Alfalfa	33.8"	23-33"
Barley, small grains	21.6"	8.6-19"
Pasture	30"	26.7-31.9"

Individual landowners methods of water application, soil uniformity, slope, depth and texture, presence of a high water table and consequent sub-irrigation, and willingness to accept less than maximum yields all affect the actual amount of water used.

Differences between the estimates of water required[12], and the observed application rates could indicate approximate maximum water savings possible with improved efficiency measures without removing ground from production. It should be noted that excessive irrigation water in many cases eventually does return to the river, greatly complicating estimates of possible increases in instream flows that might result from improvements in efficiency of use. No data is currently available on actual application rates, either within irrigation districts, or on individual properties.

Water Laws and the Shasta Valley

California water law naturally applies to water usage in the Shasta Valley. Unfortunately, water law is something that has evolved as much as a result of court cases and common law as by legislative measures, and as such should probably be described as something of a confusing mess. Never the less, the fundamentals are clear, and the few details unique to the Shasta Valley can be readily understood once put into their historical context. See also attached document *Information Pertaining to Water Rights in California, 1990.*

At the time of statehood, responsibility for determining the best uses of water passed from the federal government to the state of California. California now has a public trust responsibility to allocate water to current "beneficial uses", or hold it in reserve for future needs. In the past, nearly all beneficial uses required removing the water from a stream[13], and spreading it on the ground for mining or agricultural use, or transporting it from the stream for domestic or industrial use. More recently, the scope of what was defined as

[10] Yreka U.C. Extension Ofc, unpublished figures based on long term weather data.

[11] *Klamath River Basin Investigation*, Bulletin 83, Calif. Department of Water Resources, July 1964, page 142. Combined evaporation and transpiration from field measurements made in 1953 and 1954.

[12] The Shasta CRMP Coordinator has worked with DWR to site an installation to provide current documented estimates of plant water needs in the Shasta Valley. Installation is expected to occur in 2002 and continue for 10 years.

[13] The most notable exception would be hydropower.

beneficial use has been broadened to recognize what can most simply be described as instream flows intended to protect natural systems. The State Water Resources Control Board must pick among these competing categories whenever a request is made for use of water. (In fact, recently the courts have found that the state also may have to periodically review existing water rights to be sure they are still in the public's interest.)

Anyone wishing to make personal use of the water found in streams and rivers in California must make a formal claim on that water. The basis of that claim can either be a "riparian right", if the parcel of land on which they wish to use the water borders the stream to some extent[14], or an "appropriative right" if the water is to be used on land that does not border the stream.

Riparian rights are based on ancient common law, handed down to us from the Romans via the English. Basically, any parcel that touches any part of a river or stream is "riparian" to that stream. As such, the owner of that land is entitled to some fair share of the water in that stream for his or her own personal use. Exactly how much is dependent on what beneficial uses the owner can put the water to, and what competing beneficial uses all the other riparian landowners may have in mind. If all the riparian landowners collectively want to use more water than there is in the stream, they must either find some way to share, or eventually turn to the courts to decide who is entitled to how much. The courts would then adjudicate the various water use claims and define how the water will be apportioned in the future.

Appropriative rights were devised as a way to allow the orderly distribution of water to lands that were not "riparian". The idea was that many rivers and streams had more water than the riparian landowners could use, and that the rest was going to waste. Appropriative rights were created as water rights that were secondary to riparian rights (i.e. any request for water from a riparian landowner had to be filled before water could be given to an appropriative user). An appropriative right to the use of water is only granted after all the necessary infrastructure to put it to beneficial use is in place and demonstrated as working—ditches, pumps, distribution systems, etc. all must be functional. Up to that point there is no private water right, only an application, with a date on it which will give it priority over any other applications filed after it. Once the water can be demonstrated as having been successfully put to beneficial use, a permit is issued, granting to the applicant the right to continue to use that water as long as he or she wants. Those permits are like any other personal property, and can be bought, sold or traded, as long as they continue to be exercised by continuing to use the water where originally described. If they cease to be exercised, the water can be given to someone else.

[14] Here riparian is a legal term. Riparian land is the individual parcel of land that touches the stream. It can be as large as the original parcel first homesteaded, patented, etc. which touched the stream, or it can become progressively smaller through sub-division. It can never become larger, even if parcels are later combined. Whether or not a given parcel is riparian can only be determined with certainty through a title search.

Superficially, this all seems neat and orderly. In reality, these two systems of overlapping appropriative and riparian rights created difficult problems in terms of the orderly distribution of water. The state legislature recognized those problems and tried to resolve them in the last major revision of state water law in 1913-14.

Key Features of Water Law of 1914

Californians felt they had two major water related problems by the beginning of the 20th century—vast quantities of water were being "wasted to the ocean", and huge areas of land within the state were unusable because there was insufficient rainfall to allow the growing of crops. The solution seemed obvious enough—form associations of landowners to share the costs of applying for appropriative water rights, digging ditches and managing the water, and irrigate the dry lands with the surplus water from the streams.

It didn't take long for problems to develop—vast sums of money could be spent on developing all the necessary infrastructure to take water far from the streams, and permits for appropriative rights could even be issued, only to have some downstream riparian landowner decide he needed the water instead, and invariably the courts would affirm that riparian rights were superior to appropriative rights and the entire investment spent developing the appropriative water was lost. The consequence was predictable--good land continued to lay fallow, vast quantities of water continued to go to the sea, and the cities bulged with increasing numbers of underemployed people, threatening social unrest.

In addition, the riparian water rights system itself was also broken. How could landowners stretched over hundreds of miles of a single river be expected to coordinate their individual needs for water in order to divide it up in some fair fashion? Even if they could, how could anyone afford the time to make sure that agreements were adhered to?

The legislature concluded that the common law approach of riparian rights in many cases simply wasn't working, and often served as a roadblock that prevented the implementation of appropriative uses of water too. So in 1914, they decreed that all riparian rights not exercised within 10 years would be lost, and all future water rights from that point on would have to be secured by appropriation. They gave landowners 10 years to implement any plans they might have for their riparian rights, but after that it would be a matter of "first in time, first in right" in applying for the use of the peoples water, with no more undefined and unpredictable riparian rights blocking the orderly development of the huge areas of irrigable land in California.

The water law of 1914 also included provisions that allowed water users to ask the courts to sort out conflicting claims for water (adjudication processes), and created the Department of Water Resources (DWR), with the authority to provide watermasters[15] with the legal authority to assure adherence to the courts' findings.

[15] Watermasters act as agents of the court, and are empowered to enforce the terms of the adjudication, and also help people to understand and comply with all water law. The costs of watermaster service are paid by

The Shasta Valley—

Throughout the state, as 1924 neared, irrigation districts had formed to take advantage of unused water, confident that few if any major changes could occur before the 1924 end of riparian rights. And by 1924, many watersheds, including the Shasta Valley, had requested that adjudication of the water rights be done. People were tired of sleeping on their diversion dams all summer to protect them, or finding them blown up, or having to drive from one end of the valley to the other trying to force appropriative users to cease using water that legally belonged to riparian users. By 1932, all the necessary information about uses of water in the Shasta Valley had been gathered. State Water Law of 1914 assured that no future riparian water rights could be initiated, and the Siskiyou County Superior Court confidently issued a decree listing how water was to be divided amongst all the existing water users in the Shasta Valley.

No one in the Shasta Valley seemed to recognize it at the time, but three years later, in 1935, the Shasta Valley Adjudication (along with several others) was dealt a severe blow. That year, the state Supreme Court, in the *Long Valley Decision*, concluded that the legislature had acted unconstitutionally in extinguishing riparian rights, and they were therefore re-instated. The Shasta Valley, along with numerous other watersheds that had adjudicated their water rights early on, was left with a court order that appeared to limit the exercise of future water rights except through the "first in time first in right" appropriation process, but which in fact could not prevent landowners of riparian land from initiating whatever future water uses they wished for their riparian lands.

Over time, most of the other watersheds in the state in a similar legal situation had enough problems that they were forced to re-do their adjudications, and through the court process were legally able to reduce riparian rights to a secondary standing, effectively eliminating them. Only the Shasta and the Carson Rivers are now left with this uncertainty. The potential costs and risks of changes to the adjudication, coupled with the fact that despite the adjudication's flaws water distribution continues to be an orderly process, has so far been sufficient to convince everyone to leave the topic alone. The primary credit for this should go to the DWR watermasters, who over the years have managed to keep the peace by one means or another. The bulk of water usage is still technically locked into the seasons of use, places of use, and quantities that were defined in 1932.

Flow gaging in the Shasta Valley

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the water users through a special property tax. Watermaster service is not mandatory, but has to be requested by some of the landowners that are subject to the adjudication.

US Geological Survey began gaging flows in the Shasta Valley in 1911. Locations have included the Shasta River near its mouth (1934-present) Shasta river near Montague ((1911-1933), Shasta near Edgewood (1962-1967) and the Little Shasta near Ball Mt. Road (1957-1978). DWR has been gaging flows at a variety of locations since 1921. See attached map.

In the course of adjudicating the water usage in the river, DWR gaged every flowing diversion, and installed gaging stations from roughly May through December of 1922, and April through December of 1923 for the Shasta River (6 stations), Parks Creek (2), Boles Creek (2), Little Shasta River (2), and Big Springs Creek (1). Combined discharges of the springs feeding Beaughan, Jackson, and Carrick Creeks were used to estimate the normal flow of each of those streams. Intermittent field measurements were made in Yreka and Willow Creeks. All of their findings can be found in the *Shasta River Adjudication Proceedings, Report on Water Supply and Use of Water from Shasta River and Tributaries, Siskiyou County, California*, July 1, 1925.

Since 1934, DWR has operated the gaging station near Montague originally established by the USGS, and since 1978 has operated the gage near Edgewood. DWR continues to maintain flumes at many diversions, but flow volumes are not recorded. Since 1934, some flow measurements were made at various springs and creeks, but this was done at the discretion of the individual watermaster, rather than on a regular basis. All flow data available can be found in the annual watermasters reports.

Apparently diversions from the Shasta were measured by the US Dept. of Agriculture in 1912, but the source of that data was unavailable (USDA Office of Experiment Stations Bulletin 254).

Conclusions

Water development and use in the Shasta Valley began in the 1850's, and has changed relatively little since the 1930's. Several large irrigation districts provide water for numerous family farms and ranches at varying prices. Rising electrical costs may push the cost of water to those users who rely on pumps to uneconomic levels, although costs will rise statewide and values for crops can be expected to adjust.

The adjudication of water rights in the Shasta Valley has managed to keep distribution of water for agricultural uses relatively orderly, but the exemption of riparian water rights from watermaster control leaves many questions unanswered, as do the unknown cumulative impacts of increasing ground water usage.

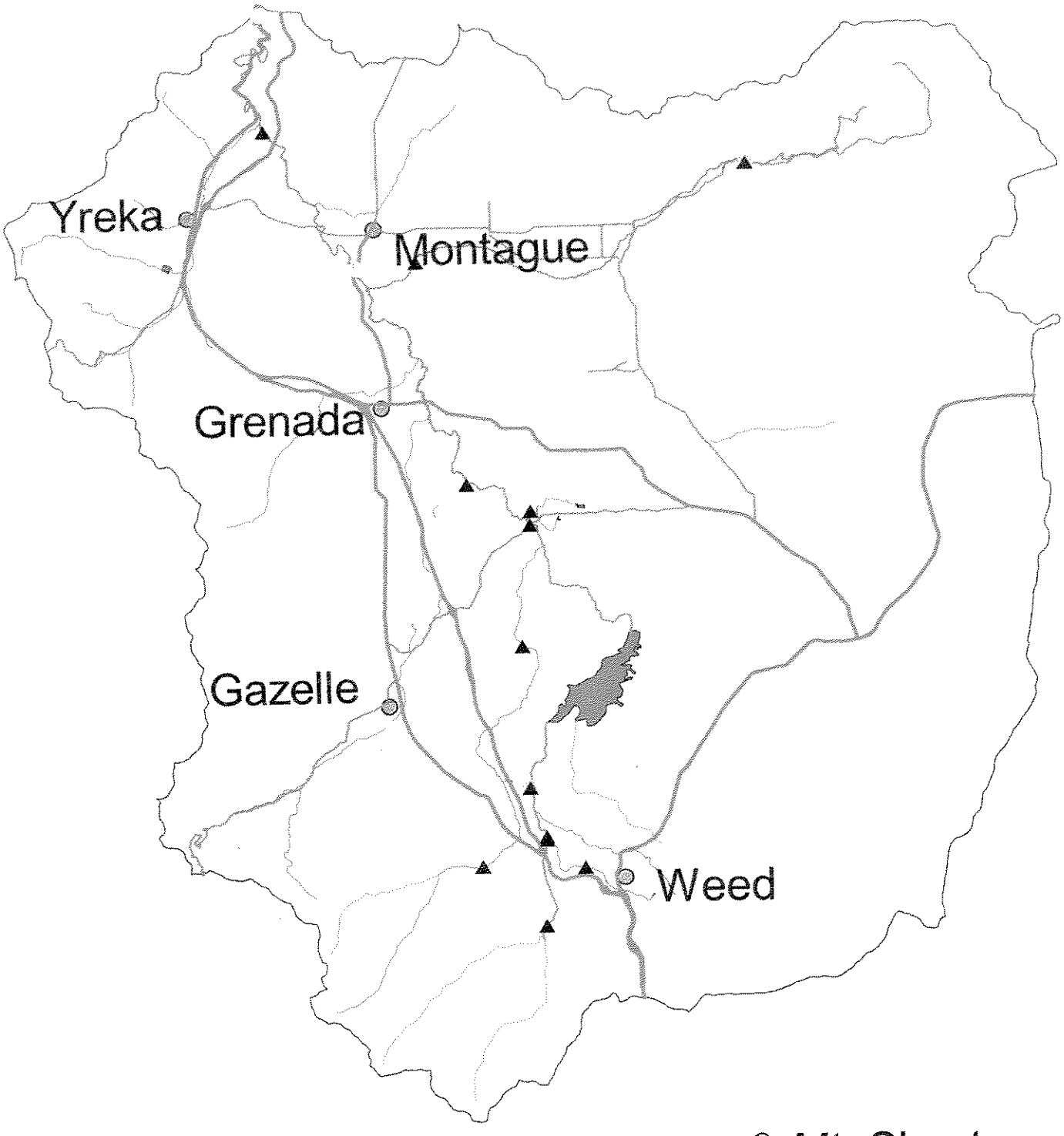
Between pressure for additional instream flows for fish, and changes in agricultural economics, the future uses of land and water in the Shasta Valley is unclear.

Attachment 1

DWR and USGS Primary Gaging Locations in the Shasta Valley

▲ DWR Gauges

USGS Gauges



Mt. Shasta

STATE WATER RESOURCES CONTROL BOARD

INFORMATION PERTAINING TO

WATER RIGHTS IN CALIFORNIA - 1990

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INTRODUCTION

Additional information concerning procedures for appropriating water is available in SWRCB's publications entitled, "How to File an Application/Registration to Appropriate Water in California" and "A Guide to California Water Right Appropriations". These free publications may be picked up from the State Water Resources Control Board, Division of Water Rights, 901 P Street, Third Floor, Sacramento, California 95814. If you wish to write for either one or both of these publications, address your request to the Division of Water Rights, Post Office Box 2000, Sacramento, CA 95812-2000 or telephone (916) 657-2170 and request they be mailed to you.

The California Code of Regulations, Title 23. Waters, contains the regulations for the administration of water rights and water quality activities of the State Water Resources Control Board. A complete copy of these regulations may be obtained at the current cost of $15.90 from the California Department of General Services, Publications section, Post Office Box 1015, North Highlands, CA 95660. A renewal service, which provides new and amended regulations also, may be obtained from the California Department of General Services at the current cost of $20.00 per year.

Booklets containing excerpts from the California Code of Regulations and the California Water Code pertaining to water rights may be obtained free of charge from the Division of Water Rights as described in the first paragraph. These booklets, however, contain information only as of the date the booklets were published.

GENERAL INFORMATION PERTAINING TO WATER RIGHTS

The following general information pertaining to water rights is offered for the guidance and assistance of those who may be interested. While believed

to be correct, the information is by no means complete. For additional information, see the California Water Code and case law.

Those to whom this general information is of particular importance or who propose to apply it to specific cases should seek the advice of an attorney or engineer, depending on the kind of information needed.

APPROPRIATIVE RIGHTS INITIATED PRIOR TO DECEMBER 19, 1914

Prior to 1872, appropriative water rights could be acquired by simply taking and beneficially using water. The priority of the right was the first substantial act leading toward putting the water to beneficial use provided the appropriation was completed with reasonable diligence; otherwise, priority did not attach until beneficial use of the water commenced.

In 1872, sections 1410 through 1422 of the California Civil Code were enacted. These sections established a permissive procedure for perfecting an appropriation of water. Provisions were made for establishing a priority of right by posting a notice of appropriation at the proposed point of diversion and recording a copy of the notice with the respective County Recorder. If these procedures were not followed, the pre-1914 appropriative right did not attach until water was beneficially used.

Once acquired, an appropriative right can be maintained only by continuous beneficial use of water. Regardless of the amount claimed in the original notice of appropriation or at the time diversion and use first began, the amount which now can be rightfully claimed under an appropriative right initiated prior to December 19, 1914 therefore has, in general, become fixed by actual beneficial use as to both amount and season of diversion. The conditions under which an appropriative right may be forfeited in whole or in part are set forth under the heading "Loss of Appropriate Rights".

Successful assertion of an appropriative right which was initiated prior to December 19, 1914, where the validity of the right is disputed, requires evidence of both the original appropriation and the subsequent maintenance of the right by continuous and diligent application of water to beneficial use (see California Water Code section 1202(b)). Frequently such evidence consists of oral testimony of persons who have actual knowledge of the relevant facts. As the years pass, such testimony, dependent upon the recollection of individuals, may become difficult or impossible to secure. At least a partial remedy for this situation may be found in the procedure for perpetuation of testimony set forth in section 2017 of the California Code of Civil Procedure.

A record of water use under "pre-1914 Appropriative Rights" should be

established by filing a Statement of Water Diversion and Use with the SWRCB.

APPROPRIATIVE RIGHTS INITIATED SUBSEQUENT TO DECEMBER 19, 1914

The two methods of appropriation existing prior to December 19, 1914, the effective date of the California Water Commission Act, no longer are available for appropriating water from surface streams, other surface bodies of water, or from subterranean streams flowing in known and definite channels. An appropriation of such water now requires compliance with the provisions of Division 2, Part 2 of the California Water Code.

The steps which now must be taken in order to initiate and acquire an appropriative water right are described under the heading "General Information Pertaining to Applications for Permits to Appropriate Unappropriated Water".

LOSS OF APPROPRIATIVE RIGHTS

By Abandonment - To constitute abandonment of an appropriative right, there must be concurrence of act and intent, the relinquishment of possession, and the intent not to resume it for a beneficial use, so that abandonment is always voluntary, and a question of fact (1 Wiel, 3d ed., 604, 605).

By Nonuse - Nonuse is distinguished from abandonment. Nonuse means failure to put water to beneficial use for a period of years. The courts have held that pre-1914 rights can be lost as the result of five years' nonuse (Smith v. Hawkins 42 P. 454).

California Water Code section 1241 provides for loss of appropriative rights after five years' nonuse. This section applies only to an appropriative right acquired after December 19, 1914.

RIPARIAN RIGHTS

No California statute defines riparian rights, but a modification of the common law doctrine of riparian rights has been established in this State by decisions of the courts and confirmed by the provisions of section 3, Article XIV of the California Constitution (see California Water Code sections 100, 101). Lands within the watershed of a natural watercourse, which are traversed thereby or border thereon, with the exceptions and limitations hereinafter, indicated, may be riparian. Each owner thereof may have a right, which is correlative with the right of each other riparian owner to share in the reasonable beneficial use of the natural flow of water, which passes his land. No permit is required for such use. The State Water Resources Control Board's (SWRCB) policy is to consider natural flow

as not including return flows derived from use of ground water, water seasonally stored and later released, or water diverted from another watershed. In administering the California Water Code, the SWRCB is governed by the following considerations relative to the doctrine of riparian rights as applied to this State:

1. The riparian right exists by reason of ownership of land abutting upon a stream or body of water and affords no basis of right to use water upon nonriparian land. (Rancho Santa Marqarita v. Vail, 11 Cal. 2d 501, 81 P. 2d 533)
2. In order to divert water under claim of riparian right, the diverter must use the water on riparian land but need not own the land at the point of diversion. That is, such diverter may divert at a point upstream from his land so long as permission is granted to use that point of diversion, and intervening land owners between the point of diversion and the place of use are not adversely affected by such practices. (Turner v. James Canal Co., 155 Cal. 82, 99 P. 520 (1909))
3. A parcel of land loses its riparian right when severed from land bordering the stream by conveyance unless the right is reserved for the severed parcel. The riparian right also may be destroyed when purportedly transferred apart from the land by grant, contract, or condemnation. Once lost, it cannot be restored.
4. As between riparian owners, priority of use establishes no priority of right; i.e., one cannot claim superior right merely because water was used first. (Pabst v. Finmand, 190 Cal. 124, 211 P. 11 (1922))
5. The riparian right is neither created by use nor lost by nonuse.
6. If there is insufficient water for the reasonable beneficial requirements of all riparian owners, they must share the available supply. Apportionment is governed by various factors, including each owner's reasonable requirements and uses. In the absence of mutual agreement, recourse to judicial determination may be necessary.
7. As between riparian owners, one of them may take the whole supply if necessary for strictly domestic use; that is, for so-called "natural uses ... arising out of the necessities of life on the riparian land, such as household use, drinking, watering domestic animals." (1 Wiel, 3d ed., Water Rights in the Western States, page 795; Deetz v. Carter, 232 Cal. App. 2d 851; but see Prather v. Hoberg, 24 Cal. 2d 549, 150 P. 2d 405, re an equitable apportionment where the use is commercialized as for resort purposes and therefore is not strictly domestic.)
8. The riparian owner is subject to the doctrine of reasonable use, which limits all rights to the use of water to, that quantity reasonably required for beneficial use and prohibits waste or unreasonable use or unreasonable methods of use or diversion. (Sec. 3, Art. XIV, Const. of Cal.; Peabody v. City of Vallejo, 2 Cal. 2d 351, 40 Pac. 2d 486; Tulare Irr. Dist. et al v. Lindsay Strathmore Irr. Dist., 3 Cal. 2d

489, 45 Pac. 2d 972; Rancho Santa Marqarita v. Vail, 11 Cal. 2d 501, 81 P. 2d 533)

9. A riparian right may be impaired or lost through prescription. Refer to the following section, "PRESCRIPTION".
10. The riparian right attaching to a particular parcel of land is subject to appropriative rights established by diversion upon vacant public domain before the first valid steps were taken to acquire said parcel of land from the United States, whether diversion was made at points upstream or downstream.
11. The riparian right cannot be transferred for use upon another parcel of land.
12. The riparian right does not apply to foreign water; i.e., water originating in a different watershed cannot be used under claim of riparian right. (E. Clemens Horst Co. v. New Blue Point Mining Co., 177 Cal. 631, 171 P. 417; Crane v. Stevinson, 5 Cal. 2d 387, 54 P. 2d 1100; Rancho Santa Marqarita v. Vail, 11 Cal. 2d 501, 81 P. 2d 533)
13. Water cannot be stored and withheld for a deferred use (other than regulatory storage) under claim of riparian right. (Seneca Consol. Gold Mines Co. v. Great Western Power Co., 209 cal. 206, 287 pac. 93; Colorado Power Co. v. Pac. Gas and Electric Co., 218 cal. 559, 24 p. 2d 495; Moore v. CaliforniaOregon Power Co., 22 cal. 2d 725, 140 p. 2d 798)

A record of water use under riparian claim should be established by filing a Statement of Water Diversion and Use with the SWRCB.

PRESCRIPTION

A right secured by appropriation does not depend upon use for any given length of time. It is complete immediately upon full beneficial use being made of water pursuant to a permit. The right, however, is subordinate and subject to all prior vested rights, whether appropriative or riparian. This limitation may be removed under certain circumstances by continuous use adverse to prior rights for five years and failure of the owners of the prior rights to file legal action to protect themselves during that time. Their cause of action then becomes barred by the statute of limitations. The right of the subsequent appropriator thereafter no longer is subject to the prior vested rights. This result is called a prescriptive right to the use of water.

In order for an appropriative or riparian claim to ripen into a prescriptive right as against the owner of a riparian or a prior appropriative right, the use must be continuous and uninterrupted for a period of five years. During all of such time, the use must be open and notorious, exclusive, under claim of right, hostile and adverse to the title of the prior owner, and an invasion of the prior owner's right. The

prior right owner must have had an opportunity to prevent the adverse use by legal action, and such taxes as are assessed must be paid. Absence of any of these conditions is fatal to the acquisition of a prescriptive water right.

Water users ordinarily have no concern with the use of water by others after it has passed their land or point of diversion. The upstream users thus have no legal right to prevent downstream use. A well-established rule is that a prescriptive water right ordinarily cannot be acquired against an upstream user.

A right cannot be acquired by prescription to use a greater quantity of water than reasonably is necessary for the beneficial purpose served, regardless of the amount actually used, in accordance with the constitutional amendment of 1928 (art. XIV, sec. 3).

Since enactment of the California Water Commission Act on December 19, 1914, a right to appropriate or use water (other than as a riparian or overlying owner, or appropriator of percolating ground water, or stockponds that comply with article 2.5, commencing with section 1226 of chapter 1 of part 2 of division 2 of the California Water Code), cannot have been secured without first obtaining a permit from the State (see California Water Code section 1225 and Crane v. Stevinson, 5 cal. 2d 387, 54 p. 2d 1100). Although one who now uses water without a permit for a sufficient period of time may, under certain circumstances foreclose objection by those who have been adversely affected, such user thereby does not acquire a right to prevent diversions by others which deplete the supply of water available. California courts have not been called upon to determine this precise question. In view of the uncertainty in this respect and because a prescriptive right can be finally determined only by a court of competent jurisdiction, the policy of the SWRCB is to disregard a claim to water subject to the permit procedure which is based only upon use initiated subsequent to 1914 unless such use is supported by a permit.

In PecDle v. Shirokow (1980) 26 cal. 3d 301, the California Supreme Court addressed the question of whether a person who does not hold a water right permit or license may establish a prescriptive water right to divert and use water. The Court held that the water appropriation procedure established by statute constitutes the exclusive method of acquiring a right to appropriate or use water, which is subject to appropriation. Since Shirokow was using water and held no permit or license authorizing an appropriation of water, the Court concluded that such use of water was improper. In addition, the Court held that the State's governmental interest in regulating the use of public water is a public right, which cannot be lost through prescription.

VESTED APPROPRIATIVE AND RIPARIAN RIGHTS NOT AFFECTED BY FILING AN APPLICATION

An existing valid riparian or appropriative right will be neither strengthened nor impaired by a permit to appropriate water issued to the owner of such right (see Barr v. Branstetter, 42 cal. app. 725, 184 p. 409). An application to appropriate water may be filed by such owner, however, in the following instances: (1) to initiate a right to additional unused water where water is available for further appropriation in excess of that covered by the existing right; and (2) to establish a new right to water already in use by applicant where the validity of the existing right has not been adjudicated or is in doubt. In either event, the priority of the right acquired by beneficial use under the permit will be the date of filing the application--the priority will not relate back to the time of the first use under a former claim.

The California Code of Regulations, title 23~ section 731, requites an applicant for a permit to list all claims to existing rights for the use of all or part of the water sought by the application. A permit, if issued, will limit the water to be appropriated so that existing rights, combined with the permit will not yield a right to use an unreasonable quantity of water. Subsections (c), (d), and (e) of section 731 contain penalties for anyone who transfers an existing right before, or does not claim an existing right until, a permit or license is issued. This provision is in recognition of the fact that a permit should be issued only for unappropriated water, and that water which is being used pursuant to an existing right is not unappropriated, whether the right is being exercised by the applicant or by another person.

DISPUTES OVER THE USE OF WATER

The right to use water is a property right and may be protected against infringement in the same manner as any other property right; i.e., by appropriate court action. The SWRCB does not have the authority to determine the validity of vested rights other than appropriative rights initiated December 19, 1914 or later. The SWRCB, however, may assist the courts in such determination as described in the following paragraphs entitled, "Determination of Existing Rights". The SWRCB will investigate and take appropriate action on a written complaint received alleging (1) a violation of the conditions of a permit or license issued by the SWRCB, (2) waste or unreasonable use of water, (3) illegal diversion or use, or (4) unreasonable effects on public trust or public interest uses of the water. (See title 23, chapter 3, subchapter 2, articles 18 and 22 of the California Code of Regulations; California Water Code section 275 et. seq.; and California Water Code section 1050 et. seq.)

When a complaint of an illegal diversion or use is filed, the SWRCB will take action under section 1052 of the California Water Code. Subsection (a) provides that "The diversion or use of water subject to this division other than as authorized in this division is a trespass." Subsection (d) provides, in part, that "Any person or entity committing a trespass as defined in this section may be liable for a sum not to exceed five hundred dollars ($500) for each day in which the trespass occurs. The Attorney General, upon request of the SWRCB, shall petition the superior court to impose, assess, and recover any sums pursuant to this subdivision. " SWRCB policy is to initiate court action only in a clear instance of unlawful use of water. Where there is a bona fide dispute as to the facts, or where circumstances indicate an adjudication is required, action by the SWRCB under section 1052 generally is not considered appropriate.

PUBLIC TRUST

With its roots in Roman law, the doctrine of public trust holds that certain resources are the property of all. In its modern form, the public trust doctrine holds that a state, as sovereign, takes title to tidelands and the beds of nontidal navigable waters at the time the state is admitted to the Union. Holding these lands and the waters above them in trust, the state's duty is to exercise continued supervision over the trust for the benefit of the people. Entities acquiring rights, for example in navigable streams, lakes, marshlands and tidelands, generally hold those rights subject to the trust and can assert no vested right in a manner harmful to the public trust. In other words, rights acquired in public trust resources cannot be placed entirely beyond the direction and control of the state.

The scope of the public trust doctrine continues to evolve as popular perceptions of the values and uses of waterways change. The public trust was traditionally defined to protect navigation, commerce, and fisheries; but recently it has been held to include the right to fish, hunt, bathe, swim, boat, recreate, navigate, and use the bottom of navigable waters for anchoring, standing, or other purposes.

In this century, the California courts have interpreted the legal term "navigable" very broadly to include recreational rafting and kayaking which can take place in very shallow water. Within the last decade, the California Supreme Court has recognized that uses of public trust resources include the preservation of the land, especially tideland, in its natural state to serve as ecological units for scientific study, as open space, and as habitat for birds and aquatic life. In administering the public trust, the courts have allowed the state to favor one use over another.

In its presently-developed form, the public trust doctrine requires the courts and the SWRCB to perform a balancing test to weigh the potential

value to society against the impact on trust resources of a proposed or existing diversion. The action which will feasibly protect public trust values must be implemented.

On February 17, 1983, the California Supreme Court filed its decision in National Audubon Society v. Superior Court of Alpine County, 33 Cal. 3d 419, 189 Cal. Rptr. 346 (1983). The Court merged the public trust doctrine with the California water rights system. The Court also held that all uses of water, including public trust uses, must conform to the standard of reasonable use. The Court further held that the SWRCB has a duty to consider public trust values before it approves water right applications. Finally, the Court held that the SWRCB has a continuing duty to supervise the taking and use of appropriated water.

DETERMINATION OF EXISTING RIGHTS

Court Reference. When a suit is brought by private parties in any court of competent jurisdiction in this State for determination of water rights, sections 2000 and 2001 of the California Water Code provide that the case, at the discretion of the court, may be referred to the SWRCB, as referee, for investigation. All rights of whatever character may be included under this procedure.

Statutorv Adjudication. section 2525 of the California Water Code provides for the initiation of proceedings for the determination of all rights to the water of any stream, lake, or other body of water except percolating underground water. A petition signed by one or more claimants of the right to the use of water from the source involved must be filed with the SWRCB. The procedures outlined in sections 2500 through 2900 of the California Water Code must be followed.

If a determination is undertaken under either the court reference or statutory procedure, the SWRCB thoroughly investigates the stream system and water rights involved. In general, such investigation will include measurements of the water supply and of all diversions from the stream system, a survey of all diversion systems and areas irrigated therefrom, and a determination of the duty of water for irrigation and other uses.

After due notice to all parties, the SWRCB prepares findings which are submitted to the court. The court itself hears those who may be dissatisfied with these findings and enters a decree establishing the various rights involved.

The court also sets forth the relative priority, amount, purpose of use, season of diversion, point of diversion, and place of use of each right. Appeals from such decree may be taken in the same manner and with the same

effect as in other civil cases.

By virtue of the above procedures, the SWRCB may supplement with effective and expeditious methods the work of the courts in determining water rights. These procedures lead to a complete and final determination of all the water rights involved, and, should necessity arise, a watermaster may be appointed to administer the stream and insure distribution of the water as decreed.

A copy of the SWRCB's publication, "Regulations and Information Pertaining to Determination of Rights to the Use of Water in California" may be obtained on request.

APPROPRIATION OF UNDERGROUND WATER

The jurisdiction of the SWRCB to issue permits and licenses for appropriation of underground water is limited by section 1200 of the California Water Code to "subterranean streams flowing through known and definite channels".

If use of underground water on nonoverlying land is proposed and the source of the water is a subterranean stream flowing in a known and definite channel, an application pursuant to the California Water Code is required. A Statement of Water Diversion and Use should be filed for use of water from a subterranean stream on overlying land (see Statements of Water Diversion and Use section of this document).

Underground water not flowing in a subterranean stream, such as water percolating through a ground water basin, is not subject to the SWRCB's jurisdiction. Applications to appropriate such water, regardless of use, should not be submitted. Owners of lands overlying a ground water basin or other common source of supply have the first right to withdraw water for reasonable beneficial use on their overlying lands, and the right of each owner is equal and correlative to the right of all other owners similarly situated. In case of insufficient water to supply fully the requirements of all, the available supply must be equitably apportioned. In these respects, overlying rights are closely similar to riparian rights pertaining to surface bodies of water.

Subject to future requirements on overlying lands, surplus water which may be withdrawn without creating an overdraft on the ground water supply may be appropriated for use on nonoverlying lands. Such appropriation is accomplished simply by use--no permit is required. An application filed to appropriate underground water subsequently may be rejected if the water it seeks to appropriate is not flowing through a known and definite channel.

Division 2 of Part 5 of the California Water Code, commencing with section 4999, requires every person who extracts ground water within the counties of Riverside, San Bernardino, Los Angeles, and Ventura in excess of 25 acre-feet per annum (with certain exceptions) to file a notice with the SWRCB on forms provided by the SWRCB. Copies of the SWRCB's rules, together with further information concerning this requirement, may be obtained on request.

Every person who intends to dig, bore, drill, deepen, or reperforate a water well must file a notice of intent with the California Department of Water Resources. The notice must be filed on forms furnished by the Department and must contain information required by the Department. A report of completion also must be filed with the Department on forms furnished by the Department and containing information required by it (California Water Code sections 13750, 13751). These requirements also apply to any person who converts, for use as a water well, any oil or gas well originally constructed under the jurisdiction of the California Department of Conservation pursuant to the provisions of Article 4, Chapter 1, Division 3 of the California Public Resources Code. Further information or forms may be obtained from the California Department of Water Resources, Division of Planning, Post Office Box 942836, Sacramento, CA 942360001.

SPRING WATER

Courts have held that water in springs and standing pools which have no natural outlet belong to the owner of the land on which these sources are located (see State v. Hansen, 189 Cal. App. 2d 604). Such water may be used without obtaining a permit.

If a spring contributes to a flowing stream, either by surface or subterranean means, the doctrine of correlative rights applies between the owner of the spring and those riparian to the stream. The right of the owner of a spring likewise is correlative with the right of those using ground water which supplies the spring. A Statement of Water Diversion and Use should be filed for such use.

NO ASSISTANCE RENDERED IN SECURING RIGHT OF ACCESS TO POINT OF DIVERSION OR RIGHT-OF-WAY

The SWRCB will not assist in the matter of securing right of access to the stream or other source of supply, or in securing rights-of-way for ditches and conduit lines. In accepting an application or in issuing a permit, the SWRCB does not affirm that the applicant or permittee has right of access to the source of supply or necessary rights-of-way. The SWRCB will accept an application for filing before right of access has been secured. The SWRCB, however, may refuse to approve the application when the applicant

apparently will be unable to secure right of access (see Title 23 of the California Code of Regulations, sections 775, 776, and 777).

PATENTS AND HOMESTEADS

All patents granted or homesteads allowed by the U. S. Bureau of Land Management shall be subject to any vested and accrued water rights as may have been recognized and acknowledged by the local customs, laws, and decisions of courts (30 USCA 278, 287).

SUPERVISION OVER DAMS

Division 3 of the California Water Code, commencing with section 6000 et seq., requires that construction or enlargement of any dam over a certain height and storage capacity shall not be commenced without written approval of the plans and specifications by the California Department of Water Resources. The California Department of Water Resources ordinarily will require a statement that the SWRCB is satisfied as to the adequacy of the water right.

Dams subject to supervision are as follows:

1. Dams which are 25 feet or more in height from downstream toe to spillway level provided they store more than 15 acrefeet of water.

2. Dams which store 50 acre-feet or more of water provided they are more than 6 feet in height from downstream toe to spillway crest.

Further information concerning construction or enlargement of any dam may be obtained from the California Department of Water Resources, Division of Safety of Dams, Post Office Box 942836, Sacramento, CA 94236-0001.

Further information concerning construction or enlargement of any dam may be obtained from the California Department of Water Resources, Division of Safety of Dams, Post Office Box 942836, Sacramento, CA 94236-0001.

PROVISIONS OF FISH AND GAME CODE

The owner of a dam is required to allow sufficient water to pass downstream at all times in order to keep fish below in good condition (section 5937, Article 2, Chapter 3, Part 1, Division 6 of the California Fish and Game Code). For purposes of Article 2, "dam" includes all artificial obstructions. Further information relating to the requirements of the California Department of Fish and Game may be obtained from local game wardens or from the California Department of Fish and Game, 1416 Ninth Street, Sacramento, CA 95814.

STATEMENTS OF WATER DIVERSIONS AND USE

All diverters of surface water, with certain exceptions, are required to file a Statement of Water Diversion and Use with the SWRCB (see Division 2 of Part 5.1 of the California Water Code). The requirement applies to water diverted under claim of riparian right and to appropriations initiated prior to December 19, 1914, the effective date of the California Water Commission Act. Forms may be obtained from the Division of Water Rights, Post Office Box 2000, Sacramento, CA 95812-2000. One purpose of filing Statements of Water Diversion and Use is to make a public record of all surface diversions not already on file with or known to the SWRCB. The following types of diversions are excluded from the requirement:

1. From a spring which does not flow off the property on which it is located.

2. Covered by an application, permit, or license to appropriate water on file with the SWRCB.

3. Included in a notice filed under the recordation of ground water extractions law (Division 2 of Part 5 of the California Water Code) in the counties of Riverside, San Bernardino, Los Angeles, and Ventura.

4. Regulated by a watermaster appointed by the California Department of Water Resources.

5. Reported by the California Department of Water Resources in its hydrologic data bulletins.

6. Included in the consumptive use data for the delta lowlands published by the California Department of Water Resources in its hydrologic data bulletins.

7. Included in annual reports filed with a court or the SWRCB by a watermaster appointed by a court or pursuant to statute to administer a final judgement determining rights to water, which reports identify the persons who have diverted water and give the general place of use and the quantity of water which has been diverted from each source.

8. For use in compliance with the provisions of Article 2.5 (commencing with section 1226) of Chapter 1 of Part 2 of Division 2 of the California Water Code concerning stockponds.

A statement should be completed for diversions during a calendar year and should be filed before July 1 of the following year. Supplemental

statements are required at three-year intervals thereafter.

STOCKPOND RIGHTS

The stockpond program was 'sunset' by the Legislature as of December 31, 1997.

Under certain conditions, the owners of stockponds having a capacity of not more than 10 acre-feet as of January 1, 1975 which were constructed prior to 1969 have a valid water right. Prior to January 1, 1975, a right for seasonal storage of water in a reservoir of any kind could be obtained only by appropriating the water through the application-permit-license procedure, and this is still the only way to obtain a water right for stockponds constructed after January 1, 1969 or which are larger than 10 acre-feet. Claims of rights for such stockponds and applications for this certification should be filed with the SWRCB. The priority of the right will be subject to other stockpond water rights on which certificates have been issued by the SWRCB with an earlier priority, to appropriative water rights with an earlier priority, and to riparian rights. The priority of the right will be the date the claim is filed. Ponds which were the subject of water right litigation between private parties prior to January 1, 1974 are excluded.

Before a certificate of validity of the stockpond right is issued, the SWRCB will verify the location of the pond, its capacity, and that it is used primarily for stockwatering purposes. In some cases, a field investigation is necessary. The original certificate will be filed with the SWRCB and will be available for public inspection. A copy of the certificate will be mailed to the owner of the stockpond. So that the records may be reasonably current, a statement of continued existence of the pond and its use for stockwatering will be solicited from the owner as determined by the SWRCB (currently every 10 years). If the water has ceased to be used primarily for stockwatering, the SWRCB may revoke the certificate after notice and an opportunity for hearing.

A reasonably accurate estimate of the capacity of a stockpond of 10 acre-feet or less can be computed by use of the "onethird rule' as follows:

Stockpond capacity in acre-feet = 1/3 height of dam to spillway crest, in feet, multiplied by the surface area of pond when full, in acres.

GENERAL INFORMATION PERTAINING TO APPLICATIONS FOR PERMITS TO APPROPRIATE UNAPPROPRIATED WATER

The following information describes the statutory procedure for acquiring appropriative water rights. It is intended as a guide for persons who

propose to take water from a surface or underground source or who are uncertain as to the validity of their present taking. Those who are not already familiar with the procedure should carefully read this information.

WHO SHOULD FILE AN APPLICATION

Since December 19, 1914, the appropriation of water in surface streams and other surface bodies of water and in subterranean streams flowing through known and definite channels has been governed by the California Water Commission Act (Statutes 1913, Chapter 586) now contained in the provisions of the California Water Code.

New legislation, effective January 1, 1989, modified the California Water Code to provide two methods of appropriating water through the California State Water Resources Control SWRCB. Provisions were added to the law for registering small domestic use appropriations, rather than applying for a water right permit under the existing process.

Small domestic use includes normal domestic use, plus incidental stockwatering of domestic animals and incidental irrigation of one-half acre or less of lawn, garden, and pasture at any single establishment, not exceeding 4,500 gallons per day by direct diversion or 10 acre-feet per annum by storage, the latter including incidental aesthetic, recreational, or fish and wildlife enhancement purposes. Refer to the SWRCB's booklet, "How to File an Application/ Registration to Appropriate Water in California" for specific information on filing for a permit or for registering a small domestic use appropriation.

Anyone who intends to divert water from surface waters or subterranean streams flowing in known and definite channels, either (1) directly to use on land which is not riparian to the source, (2) to storage in a reservoir for later use on either riparian or nonriparian land, or (3) for direct use of water which would not naturally be in the source, should apply with the SWRCB for a permit or small domestic use registration as the first step toward securing an appropriative water right. Persons diverting water under riparian or pre-1914 claims of right, with certain exceptions, are required to file a Statement of Water Diversion and Use with the SWRCB.

WHO SHOULD NOT FILE AN APPLICATION

Underground water is not subject to the permit procedure unless it is the underflow of a surface stream or otherwise is flowing in a subterranean stream with a known and definite channel. One who proposes to pump ground water (with the exceptions noted) should not file an application. Anyone who pumps ground water in the counties of Riverside, San Bernardino, Los Angeles, and Ventura, with certain exceptions is required to file a notice

with the SWRCB (see section 4999 of Division 2 of the California Water Code).

A permit is not required for the proper exercise of a riparian right. Diverters of surface water, with certain exceptions, are required to file a Statement of Water Diversion and Use with the SWRCB.

PURPOSE OF FILING

The purpose of filing an application for a permit is to secure a right to the use of unappropriated water; i.e. water that is available and is not already in use under prior and existing rights. The purpose of filing also is to establish a record of the right sought under the application so that its status in relation to other rights may be determined more readily. One who takes and uses water without possession of a valid right or first obtaining a permit does so at his own risk and is subject to possible court action to enjoin his use.

An application should not be filed in order to adjust a dispute which has arisen over water. Permits issued by the SWRCB cannot serve to ratify or confirm existing rights claimed by the applicant.

WHEN TO FILE

An application should be filed well in advance of construction of diversion works. An application, however, should not be filed until a definite plan has been formulated for construction of a project for use of water within a reasonable time in the future. What is reasonable depends on the size of the project and the circumstances of each case. In every case, the applicant should be prepared to commence construction work within the time ordered by the SWRCB and thereafter to complete construction and use of water with diligence. For most privately-owned projects designed to serve the individual needs of the applicant, the SWRCB will require actual construction to commence within a few months after issuance of permit. The filing of an application cannot serve to reserve water for an indefinite future use. Requests for undue delay in final disposition of an application will be denied.

UNAPPROPRIATED WATER AND RESPONSIBILITIES OF PERMITTEES

All applications are for permits to appropriate unappropriated water, and all permits are issued subject to vested rights. In order for the SWRCB to approve an application, unappropriated water must be available to supply the applicant. Water in many streams already has been fully appropriated during the dry seasons of the year. If there is doubt whether unappropriated water is available, the SWRCB's staff should be consulted

before an application is filed.

The flow of water in most streams is variable and cannot be predicted with accuracy. Approval of an application and issuance of a permit thus does not guarantee that unappropriated water will be available at all times in the full amount specified in the permit. In some cases, there may be times during the authorized diversion season when no unappropriated water will be available. The holder of a permit should be prepared to accept responsibility for diverting only to the extent and at such times as will not

Impair the prior rights of others, regardless of the amount or season named in the permit. The holder of the permit likewise must defend the right if it is attacked by others. A water right is a property right, and the owner has the same obligation to defend it against encroachment as in the case of any other kind of property.

OUTLINE OF ESSENTIAL STEPS

The California Water Code and the regulations adopted pursuant thereto prescribe a definite procedure for the initiation and consummation of rights to appropriate water by permit. The essential steps are as follows:

Appropriation bv Permit:

1. An application is filed with SWRCB on forms provided. If the application is not complete, failure to complete it within the time allowed by the SWRCB will result in cancellation.

2. Notice of application is issued by the SWRCB and is posted or published by the applicant, depending on the size of the project.

3. If protests are received which cannot otherwise be adjusted, a hearing or an investigation under a proceeding in lieu of hearing is held. At the discretion of the SWRCB, a hearing also may be held on an unprotested application.

4. The application is reviewed and analyzed for possible environmental impacts as required by the California Environmental Quality Act of 1970.

5. If an application is approved and permit fees paid, a permit is issued. A reasonable time is allowed within which to begin construction of the diversion works, complete the construction, and make full beneficial use of the water. These times may be extended upon request if there are good reasons for doing so. Failure to comply with the time requirements or other-permit terms will be investigated by the SWRCB, and findings against

the permittee may result in revocation of the permit.

All permits are issued SUBJECT TO PRIOR RIGHTS, and the permittee is required to respect all prior rights when diverting under the permit.

6. When construction and use of water are complete to the full extent contemplated, an inspection is made for possible issuance of a license. To the extent that beneficial use of the water has been made, as to both amount and season as specified in the terms and conditions of permit, a license may be issued.

A license has no time limit and continues as long as proper use is made for the water and required reports are submitted.

Statutes provide that, under certain conditions, a license may be lost through a five-year period of nonuse.

Appropriation by Registration:

1. Forms to file for appropriation of water by registration are provided by the SWRCB.

2. The Environmental Services Supervisor for the California Department of Fish and Game region in which the diversion will be located (map, address, and telephone number are included on the form) is contacted to discuss the proposed project and to obtain answers to the questions contained on the Fish and Game Information form.

3. Registration forms are filed with both the State Water Resources Control SWRCB and the regional office of the California Department of Fish and Game.

4. If the registration is complete, fees have been paid, and written approval has been received from both the SWRCB and the California Department of Fish and Game, construction of the project may begin and diversion of water made.

5. If the forms are not complete, failure to complete them within the time allowed by the SWRCB will result in the return of all materials and fees.

PREPARATION OF APPLICATIONS

The SWRCB publishes a pamphlet entitled, "How to File an Application/Registration to Appropriate Water in Californians which will be of assistance in completing the blanks of an application form. When an application fails to comply with provisions of the California Water Code,

the application will not be accepted for filing.

CHANGES IN OWNERSHIP

The SWRCB must be able to communicate with a registrant, applicant, permittee, or licensee. Any changes in ownership or address therefore should be submitted promptly to the SWRCB.

The SWRCB will not settle contests as to ownership but will accept any ownership claim, which is asserted unless the owner of record or an asserted successor objects. In case of contest the SWRCB's record will not be changed until the matter is settled by agreement or by a court decision.

APPENDIX - TABLE OF EQUIVALENTS

1 CUBIC FOOT PER SECOND (cfs) is a rate of flow passing any point equal to a volume of one cubic foot of water every second (sometimes referred to as second-foot) and is equivalent to:

= 7.48 U.S. gallons per second (gps)

= 448.8 U.S. gallons per minute (gpm)

= 646,317 U.S. gallons per day (gpd)

= 1.98 acre-feet per day

= 40 standard (statute) miners' inches

= 28.32 liters per second

1 ACRE-FOOT (af) is the amount (volume) of water which will cover one acre to a depth of one foot and is equivalent to:

= 43,560 cubic feet

= 325,851 U.S. gallons

= 1,233.45 cubic meters

1,000,000 U. S. GALLONS PER DAY is equivalent to:

= 1.55 cubic feet per second

= 43.81 liters per second

= 3.07 acre-feet per day

= 3,786 cubic meters per day

THEORETICAL HORSEPOWER is calculated by multiplying the vertical fall of water in feet by the rate of waterflow in cubic feet per second and dividing the product by 8.8. One horsepower is equivalent to:

= 550 foot-pounds per second

= 746 watts